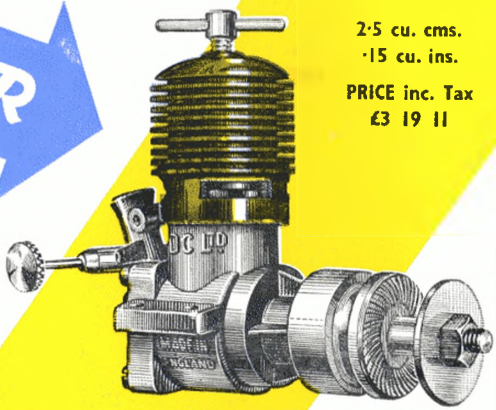
AERO MODELLER

FEBRUARY 1957

Special PLASTICS feature
Radio Control Delta Plans
Famous Biplanes-the HEYFORD

1'6

RAPIER



2·5 cu. cms.
·15 cu. ins.

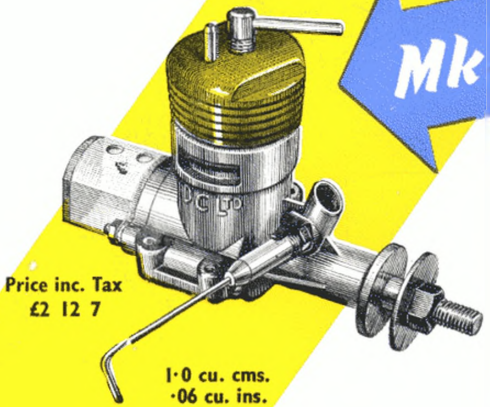
PRICE inc. Tax
£3 19 11

For the Expert . . .

the very latest in high performance design, with twin ball races for friction free running and domed piston with 360 degree porting for maximum gas flow efficiency. Down-draught carburettor and rear rotary valve induction also contribute to its breathtaking performance. Refinements such as the positive lock needle valve and provision for a two-speed fitting or choke assembly make it ideal for radio control purposes as well as the contest modeller.

Two NEW Davies Charlton Engines!

Mk II SPITFIRE



Price inc. Tax
£2 12 7

1·0 cu. cms.
·06 cu. ins.

For the Beginner . . .

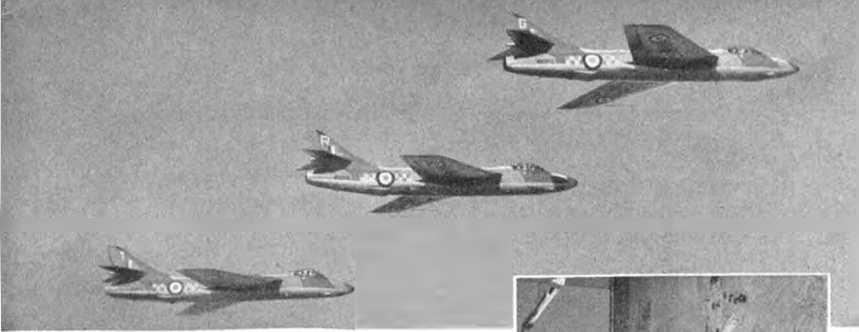
a new and improved version of this famous engine with all the original virtues of easy starting, flexibility and long life, maintained; plus sparkling increased performance. Angled, positive action needle valve keep your fingers out of the prop and a limit stop ensures that the compression adjustment can be found without difficulty. Like the "Rapier" it will be available in your local model shop at the end of January.

Look for the Green Heads!

DAVIES CHARLTON LTD., Hill's Meadows, Douglas, Isle of Man

Heirs of 'the few'

Still young, they are already proved leaders of men, already shouldering great responsibilities, already confident of a satisfying future. For the exhilaration of flight is but one aspect of a career intensely interesting and of infinite variety.



Hunter F.2 fighters (Armstrong Siddeley turbo-jets) in echelon formation.

YOUNG MEN may long for a life of action and adventure. But they have also to plan a lasting career. In the Royal Air Force today both these needs are fulfilled: linked with ample opportunities of building a satisfying future there is the exhilaration of flying some of the world's most exciting aircraft. And more can now fly, with the new appointment of air electronics officers, highly skilled men who are trained to be responsible for all the electronic devices in the new V-bombers.

Flying plus

The adventure of flight is only one of the challenges you must master in the R.A.F. Consider the responsibilities of leadership, as important on the ground as in the air. You could be a Group Captain while in your early forties, flying regularly—and responsible for several squadrons of aircraft, perhaps 1,500 men.

Standing easy

Off duty, life is just as full. Opportunities for sport are unrivalled. From football to ski-ing, yachting and athletics . . . everything comes within your reach. And an officers' mess has all the added amenities of a really good club.

A sure future — good pay

You can join the R.A.F. through the Direct Commission Scheme, confident of a permanent career right up to pension age. Or you can choose a twelve-year engagement, with the option of leaving after eight. If you leave after 12 years you take back to civilian life a tax-free gratuity of £4,000! And whichever you choose the pay is good. At the new rates, a Flight Lieutenant of 25 for instance, can draw, with full allowances, about £1,500 a year.

Per ardua ad astra

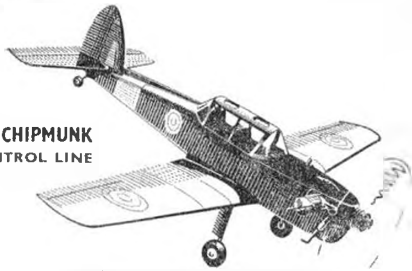
It is not easy to qualify for a place in the R.A.F., but its rewards are great and lasting. If you are between 17½ and 26 and absolutely fit, educated at least to General Certificate of Education or Scottish Leaving Certificate or equivalent standards, write for details of the schemes of entry to the Air Ministry (AM.315a), Adastral House, London, W.C.1. Give date of birth and educational qualifications.

The Royal Air Force

Flying . . . and a career

RESPONSIBILITY. To fly a complex modern aircraft, perhaps half-way round the world, calls for those qualities of enthusiasm, self-reliance and careful skill for which aircrew are specially chosen.

AND RELAXATION. The sporting and social life that revolves round an officers' mess presents unusual opportunities and wide variety. Fencing is popular. It is quick, skilful and asks for concentration. It demands give and take. It could have been made for the R.A.F.



D.C. CHIPMUNK
CONTROL LINE

A replica of the Duke of Edinburgh's trainer suitable for the Dart, Merlin or Super Merlin.

The best in KITS ENGINES and ACCESSORIES

You can rely implicitly on Davies Charlton products. They are fabricated from the finest possible materials and are designed and built by experts. Ask for our complete range at your local model shop.

DART

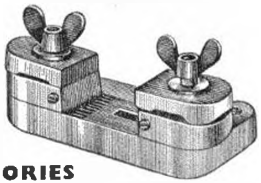
0.5 c.c. 0.03 cu. in.

Undisputed champion of the "point fives", it is built like a watch and has a performance that would not disgrace many of its larger counterparts.

Price £3.4.5

TEST STAND

Price 12/11



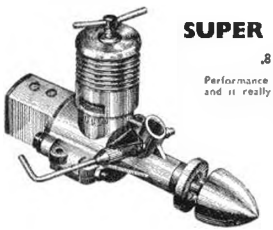
ACCESSORIES

Include: Engine Test Stand as illustrated, Combined Jet and Cut-out; Adjustable Control-line Handle; 15 c.c. Class "A" Team Race Tank; 30 c.c. Class "B" Team Race Tank; Radial Mounts, Extended Needle Valves and Compression Screws and many others.

Manufactured by

DAVIES CHARLTON LTD.

HILLS MEADOWS, DOUGLAS, ISLE OF MAN



SUPER MERLIN

.8 c.c. .049 cu. in.

Performance is as good as it looks, and it really is easy to start and operate. Ideal for the "Chipmunk" and "Ballerina" kits shown left. Complete with propeller, spinner and tommy bar.

Price £2.12.7

MATCHED PROPELLERS

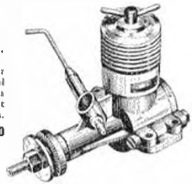
Available for every engine in two sizes, for Free-Flight and Control-line. Accurately carved in quality beech-wood, they can be relied upon to produce the best results at the right revs.

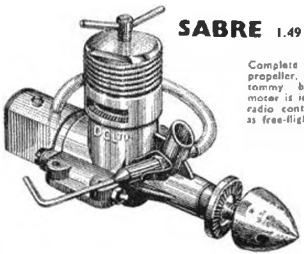
MERLIN

.8 c.c. 0.049 cu. in.

For those with a tight budget this is the ideal engine. All the virtues of the Super Merlin, but without the extra fittings.

Price £2.3.10





SABRE 1.49 c.c. 0.9 cu. in.

Complete with integral tank, propeller, spinner and tommy bar, this powerful motor is ideal for the smaller radio control model as well as free-flight and control-line.

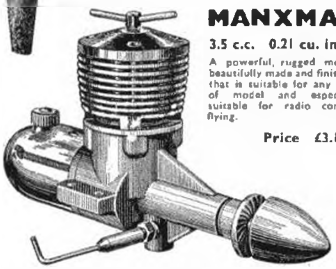
Price £2.12.7

MANXMAN

3.5 c.c. 0.21 cu. in.

A powerful, rugged motor, beautifully made and finished, that is suitable for any type of model and especially suitable for radio control flying.

Price £3.17.6



AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XXII
NUMBER 253
FEBRUARY 1957

Managing Editor - C. S. RUSHBROOKE
Editor - H. G. HUNDLEBY
Assistant Editor - R. G. MOULTON

★

Special features

★

Regular features

★

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors.

MODEL AERONAUTICAL PRESS LIMITED SUBSCRIPTION RATE: (Inland) 22/- (Overseas) 21/- per annum prepaid (including the special Christmas Number).

Editorial and Advertisement Offices:
38 CLARENDON ROAD, WATFORD, HERTS
TELEPHONE: GADEBROOK 2351 (Monday-Friday)

The shape of things to come?

"THE PLASTIC AGE has spoiled the modern Junior, and our days of flying, testing and pranging are gone. Today if a chap prangs his first model he turns to Rock 'n' Roll or building plastic kits and watching others fly."

So writes one of our keen aeromodelling correspondents who appears to consider the plastic kit outside the realm of aeromodelling. A point of view to which we do not subscribe.

The use of plastics in everyday life is now commonplace and aeromodellers have enjoyed their advantages on an increasing scale in recent years. Spinners, wheels, propellers and many other accessories have replaced their wooden counterparts, in most instances to distinct advantage.

The rapidly changing facade of our local model shops in recent months does, however, foretell the advent of a new and prodigous use of plastic in the production of scale model aircraft kits. Several millions of these plastic kits have been sold in the U.S.A. during the past two or three years and their manufacture under licence in this country is already proceeding apace. British plastic kits are being produced with gathering impetus, and we would record at this juncture that the manufacture of plastic kits, contrary to popular belief, did not originate in the States. Messrs. International Model Aircraft Ltd. did, in fact, produce their popular range of "Penguin" plastics well before the war. These kits utilised cellulose acetate moulding and not the high impact polystyrene used today. It is interesting to note that the advantages of this latter material, coupled with improved methods of die making and manufacture, enable present-day kits to be sold at a lower price than their pre-war counterparts—this in spite of production costs ten times as great!

We believe that plastic kits have their rightful place in aeromodelling, particularly as an introduction to the hobby. The young beginner—or even the not so young beginner—once he has successfully assembled and decorated his plastic model and who would deny the beauty of their detail and the accuracy of their finish—is bound to feel a sense of creative satisfaction. Sufficient to encourage him to greater constructional efforts and possibly to embark on more ambitious aeromodelling projects. To this end we begin in this issue a comprehensive article, "Improve your Plastics", which we trust will produce well-finished and accurately decorated scale models.

The use of plastic to produce ready-made aeromodelling products is, however, only just beginning. We may mourn the slackening interest in true aeromodelling craftsmanship as portrayed by a geodetic Wakefield for instance, but we cannot halt the march of progress. The Plastic Age to which our correspondent refers is here to stay and not only for the non-flying scale model.

Plastic control line models are already available in this country and the U.S.A. and as we write a very neat plastic-bodied free-flight glider arrives for review. Kits have progressed from mere bundles of wood through pre-fabrication and diecutting to the plastic ready-to-fly model which merely needs assembling. It may not be aeromodelling as the old-timers know it, but is nevertheless aeromodelling as the future will see it and something that the AEROMODELLER will cater for with its policy of covering *all* aspects of the hobby.

On the cover . . .

MIXED MARKINGS decorate the Scottish Aviation Limited "Twin Pioneer" as it takes off from Farnborough runway. G-AOEN has been temporarily coloured in the blue and white scheme of de Kroonduit, the Dutch East Indies branch of K.L.M. for demonstration purposes. By extensive use of nearly full span leading edge slats and large flaps, the Twin Pioneer has a take-off, fully loaded, of only 75 yards in still air, and is particularly suited to flying in remote areas where the landing grounds are restricted both in area and the quality of the surface.

Realistic Rapide

The elegance of the De Havilland 89a Dragon Rapide has been most realistically captured by D. Stather of West Hartlepool, whose 60-in. model is seen in this month's heading photo. Finished in maroon and cream, and weighing 2 lb. 14 oz. for its two E.D. Bee diesels, it is a remarkable free-flight experiment and has already passed initial flying tests. Both engines are fed from one central tank, and a pendulum operated rudder takes care of unequal power.

S.M.A.E. Activities

Two worthwhile functions of the Society of Model Aeronautical Engineers we have attended recently were the Annual Dinner and Prizegiving Dance held at the Horseshoe Hotel on Saturday, December 8th, 1956, and the Annual General Meeting held at the Great Northern Hotel, Leeds, on Sunday, December 16th, 1956.

The Dinner was well attended and the principal guest, Mr. R. T. Hughes, Secretary of the Society of British Aircraft Constructors, emphasised the high regard in which the full size industry held the S.M.A.E., mentioning the many famous men of aviation who had started as aeromodellers. Mr. Maurice Imray of the Royal Aero Club proposed the toast to the Society and commented on the worthwhile successes achieved on the international contest field during the past ten years. Mr. D. A. Gordon, proposing the toast to the guests and the ladies, mentioned the practical way in which the S.B.A.C. had supported the Society by donating the sum of £500 towards the International Contest Fund in 1956. The friendly relations enjoyed with the Royal Air Force Model Aircraft Association represented by their Chairman, Group Captain Saw were also commented upon, Mr. Gordon emphasising how important these relations were in view of the aerodrome situation!

Following the prizegiving by Mrs. Hughes, (and never was there such a fine display of trophies,) a general evening of fun and festivity ensued. Not the least entertainment being the sight of S.M.A.E. Chairman Alex Houlberg being persuaded into a "rock 'n' roll" session by a most agile lady partner.

On a more serious note the S.M.A.E. Annual General Meeting at Leeds voted unanimously an increase in membership fees, Seniors 12s. 6d. (10s.), Juniors 6s. (5s.), Country Members 20s. (15s.). The general feeling was that rising costs more than justified these increases, the only bone of contention being the fee for Associate Members. Here the meeting divided on a poll vote, 31 for and 25 against, the original fee of 3s. was carried against a proposed increase to 5s. Under the election of new officers Mr. D. A. Gordon became the Vice Chairman of the Society, replacing Mr. R. F. L. Gosling who was re-elected F.A.I. Delegate.

Achievements Acknowledged

November 27th, 1956, marked a significant step in the recognition of aeromodelling and those connected therewith, when members of the Royal Aero Club gave a dinner to a number of persons who had achieved notable aeronautical successes during the year.

Among those so honoured were Ron Draper and Ray Gibbs, winners of World Model Championships during 1956. Tribute was paid to the successes of S.M.A.E. members during the season, for Great Britain won two of the four individual World Championships, was second in one, and third in the other. In addition, the Power Team Championship was secured by a British team, also third placing in the Wakefield team event. All in all, a very good year for British representatives, and this point was well received by the gathering at the Aero Club.

Both modellers made excellent speeches in reply to the citations read out by Col. Preston, and paid tribute to their fellow members, and to the Society which had made it possible for them to represent their country in such important contests.

Other guests honoured were Commander H. C. N. Goodhart and Mr. Frank Foster, winners of the Two-seater World Gliding Championships, and Messrs. E. C. Bowyer, L. L. Bridgeman, P. B. Mayne, and Wing Commander W. R. Parkhouse M.B.E., recipients of F.A.I. Paul Tissandier Diplomas for 1955.

Flying Scale Models

Scarcely a day passes by without kind comment arriving at AEROMODELLER offices on the recently published book entitled "Flying Scale Models". It seems that the scale fans have been quick to recognise the comprehensive coverage of the subject in this fact-packed volume. There is one item within its covers that calls for a minor amend-

ment, and this is brought to our attention by Hunting Percival Aircraft Ltd., who supplied several of the particularly fine line illustrations. Referring to the scale drawing on page 54, we learn that the twin-engined Prince 5 is now officially titled "President", the change being made during the preparation of the book. Another small point is that the company emblem for Hunting Percival is a winged hunting horn, usually displayed on the fin.

Brink of Hell

No—this does not mean we are about to take leave of the Universe; it refers to the title of a "Toluca" Productions Film, due to have a general release through cinema circuits in Britain within the next few weeks. Solid modellers will especially enjoy this panorama of Edwards Air Force Base in California, where close-up shots both on the ground and in the air treat the viewer to hitherto unrevealed angles of the B-36, B-47, B-50, F-86d, F-94, F-100, F-101, F-102, Douglas X-3 and the two "star" aircraft, the Bell-X2 and the Martin XB-51 (appearing as the Gilbert XF-120).

The plot is melodramatic but closely allied to actual case histories of the aircraft involved and the incidents for which they have gained their great reputations. We follow the X2 in flight, right down to landing as though watched from a chase plane's cockpit, and we see flying of extremely high standard, with no recourse to obvious models.

William Holden plays the lead, with Lloyd Nolan as his tough commander, and script was by Col. Beirne Lay, Junr., who was also responsible for "Twelve O'Clock High", "Strategic Air Command" and "I Wanted Wings". Distributed by Warner Bros., it is a film all air enthusiasts will want to see.

Wipe Your Feet !

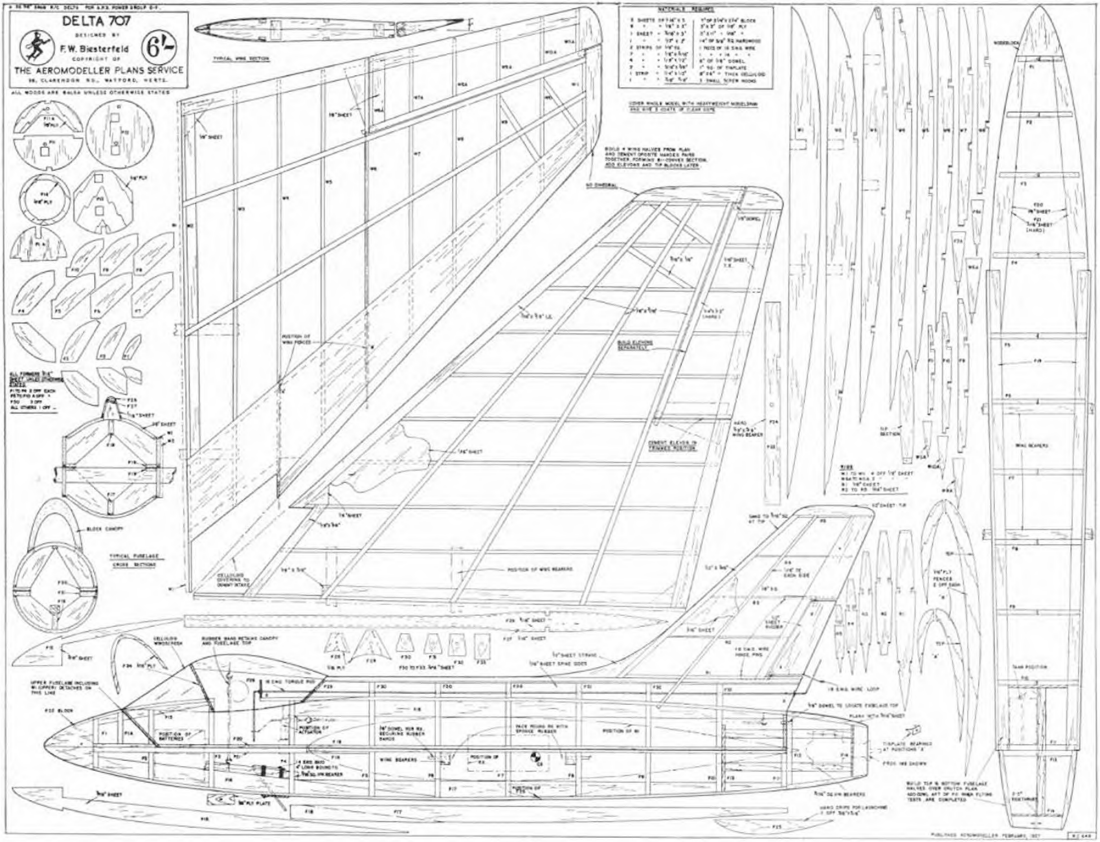
It may not be realised that farmers have some cause for concern following the crossing of their fields by anxious aeromods., searching for that

The little-known Martin XB-51, seen in "Brink of Hell"

lost plane. We well know the heartaches caused by inconsiderate trampling of growing crops, but conversation with a friendly shepherd the other day, cast new light on the subject, when he remarked that "he didn't mind the local boys running around, but it was a bit risky when chaps from other counties walked across the fields". Our puzzled enquiry brought forth the fact that that serious livestock disease, Foot and Mouth, can be so easily transmitted, that he and other livestock owners have to keep a very sharp lookout. Makes you think doesn't it . . . or does your anxiety to recover that straying model at all costs, blind you to such considerations?

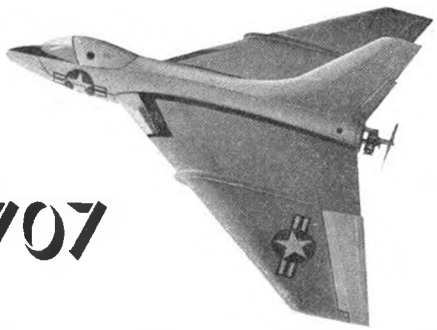
Mrs. York Senior and family desire to express their sincere thanks to the many friends who sent flowers and letters following their recent bereavement, and ask that this announcement be taken as due acknowledgment to the many who they cannot hope to reply to individually.

Happy scene at the S.M.A.E. Annual Dinner and Prize-giving. Henry J. Nicholls shows an appreciative broad grin as Silvio Lanfranchi accepts the Gamage trophy on clubmate C. P. Miller's behalf from Mrs. Hughes. Alex Houlberg observes in the background and Editor Harry Hundleby—acting as Master of Ceremonies, listens to the ever ready Silvio quip.



FULL SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE PRICE 6,- POST FREE FROM AEROMODELLER PLANS SERVICE. PLEASE QUOTE PLAN NUMBER RC 649 WHEN ORDERING

A SEMI-SCALE DELTA FOR RADIO CONTROL OR PURE FREE FLIGHT WITH A PUSHER 1·5 c.c. DIESEL. SIMPLE TO BUILD AND OF STUNNING APPEARANCE



DELTA 707

By F. W. Biesterfeld

ONCE IN A WHILE we are blessed with a model design that is completely out of the rut and capable of outstanding performance. We congratulate Ing. F. W. Biesterfeld of Hameln in Germany, for his enterprise in developing this remarkable design which has already gained a great reputation in his native country and overseas, following its appearance on the television screens.

Our attention was first drawn to the Delta 707 when photos were submitted for inclusion in our "Model News" feature of August, 1956, where we showed a view of the complete model and another with the upper fuselage removed to display radio control components. Then, the power unit was a 1 c.c. Taifun Hobby diesel and the 707 was said to have a very fast flight speed, while turns could be held on for a long time without tear of the model developing into a spiral dive.

Since publication of those photos, Herr Biesterfeld fitted a Taifun Hurrikan (as reviewed in "Engine Analysis", January, 1957) and the increase of 50 per cent. more power naturally stepped up the performance into the spectacular class. It is therefore our pleasure to present this design through A.P.S. and we are sure it will have a large following, not only among the radio control fraternity, who like to have something "new", but also among free-flight sport enthusiasts, for here is a virtually unbreakable model, and despite its beautifully streamline exterior, it is extremely easy to construct. It should be noted that following the success of this model, which was in the first place intended to be a flying test bed, Herr Biesterfeld now has a larger version with a 5 c.c. glowplug engine and a six channel receiver operating motor control, rudder and elevons.

Technical information for the radio men is that the Delta 707 has a total area of approximately 500 sq. inches and complete with an AEROMODELLER Receiver and standard lightweight actuator with all batteries, the total weight is only 33 ounces, giving 10 ounces per square foot wing loading. An undercarriage is not necessary, but to protect the under-belly, a wire skid is fitted under the nose. Access to the interior is a simple matter of lifting off the upper fuselage, half which is retained by the dowel at the rear of the engine bulkhead and elastic band up front. Basic constructional details are provided on the drawing, but in brief these are as detailed in the next column.

The mainplane is built in four quarter-sections, using the two opposite halves which are drawn on the plan to construct the four flat bottomed aerofoils. These are then paired-up with small pieces of $\frac{1}{16}$ sheet, joining the rib halves together (as indicated on W1, 2 and 3) and the result will now be two symmetrical wing halves, which are then subsequently joined on to bearers projecting through the fuselage lower half. Fuselage halves are built in turn over the top profile, using the side keels F19, 20, 21, to locate the quarter formers, which butt up to the relative top and bottom keels. The engine bulkhead, F12, is then added to the lower half and the nose block also fitted, together with the fixed portion of the upper half between F1 and 2. Root ribs W1 are added to the top and bottom sections and the wing bearers fixed at the correct alignment across F6 and 8. Now mount the engine bearers and F13, leaving the engine cowling to be completed after the initial trimming flights. The fin and dorsal spine which carries the actuator wire, are straightforward assemblies and all that needs to be added are the separate wing halves on to the wing bearers, needless to say, using extra strong slow drying glue for this vital operation.

Radio installation is indicated on the drawing and it is recommended that the final balance is obtained by shifting the batteries, the nominal position is shown between F2 and F3. These are best mounted with a surround of foam rubber to prevent them bursting through the exterior planking on the fuselage in the event of a crash.

Herr Biesterfeld recommends that the first flight tests be made without either the radio gear or the engine operative. In fact, the model is tested solely as a glider and he prefers to undertake slope soaring, which gives him a glide distance of about 500 ft. Having set the elevons to the correct trimmed position (photo in the August issue, is helpful and shows approximately $\frac{1}{8}$ in "up" on the elevons trailing edges) one could then test radio controlled glides and then eventually, power flights.

Any tendency to turn should be corrected by using engine offset and whilst for the benefit of the British modeller a Frog 1·49 diesel is indicated on the drawing, engines with ball bearings are to be preferred, because of their better load bearing characteristics when "pushing".

IMPROVE YOUR PLASTICS

FIFTEEN MILLION KITS sold by one manufacturer in a single year! That was the announced turnover for 1955, which came from but one of at least six big plastic kit companies in full-scale production in the U.S.A. Now, firms have sent their valuable moulds across the Atlantic for manufacture under licence, and at least two British companies are heavily engaged in producing good, top quality plastics that will give the American models strong competition for detail, selection of subject and quality.

The plastics have arrived in full force, to the extent that some model shops have thanked them for up to half their revenue in Christmas week, and throughout the country tens of thousands of enthusiasts, young and old have been assembling perhaps their very first model aeroplane. For models they undoubtedly are, despite the "toy" jibe so often thrown against them. We have the greatest admiration for the extremely high standard of workmanship that has gone into the intricate originals, and for the machines that make it possible to reproduce such detail so faithfully.

Whether the *assembly* of the model can be termed "Aeromodelling" *is* debatable. Our own personal experience is one of satisfaction when putting the jig-saw of these plastics together. Parts snap with a click, the finished job is worthy of the mantleshelf and in one brief evening we have something that represents more than a hundred hours of skilled workmanship in the original.

There the satisfaction wanes. In a week or two the model loses its appeal, and either a new subject arrives to whet the appetite once more, or the model loses pride of place to another fad.

The serious aeromodeller forms but a small fraction of the buying market for these new ranges, yet if only a little thought is applied, the "plastic" can be used as a basis for the finest of models and made into something that the most self-conscious solid modeller could describe as "Yes, I made that—all my own work".

Suggested improvements

Retractable undercarriages, true colour schemes, movable controls, equipped cockpits, sliding hoods, rotating gun turrets, detailed accessories and working propellers are but a few suggestions we could make for additional work on the standard kits.

The plastic offers a challenge to the serious solid modeller and will introduce thousands of casual "do-it-yourself" handymen to the hobby of model planes for the very first time. They are amazingly inexpensive—by far cheaper than the pre-war kits, yet more detailed, and, above all, they are coming at a time when the hobby movement desparately needs a stimulant for fresh enthusiasm. But do not accept them as they come, in their multi-coloured stiff boxes, ready for a half-hour session with polystyrene cement and a few rubber bands. Treat them as a challenge to your ability and like us—if you are critical—you'll find them full of openings for improvement.

Where to start? Right at the beginning, by getting a clear work table, a sharp knife, clothes pegs, rubber bands, suitable cement and the instructions which should be read and fully digested.

Use correct adhesive

The first mistake one can make is to assume that ordinary cellulose balsa cement is suitable for the Styrene plastic used on these models. If you *do* try to use this type of cement you will soon find that the edges distort as the cellulose has effect on the plastic, and the model is spoiled. Try a spot on one of the spare "flashes" in the kit and you will see what we mean. The right cement is sold either as Polystyrene or Plastic cement, or in the case of special manufacturers' items, such as Revell Type "S". Have a small duster or clean cloth handy on the work-table, for when you start to use some cements you will find the drying fluid has a tendency to "string" as you pull the tube away from the component after application. This is alleviated to some extent by some makes with special additives, but the duster or a clean finger tip will in any case quickly wipe off the excess "string" or hairline standing proud of the model part. But before even piercing the cement tube, check off the contents of your kit against the illustration in the instructions which usually tells you the number of parts required.

Then, assemble parts "dry" to make sure you are familiar with the full sequence of assembly and appreciate what has to be painted before each assembly stage is completed. At the same time, wing root joints, fuselage halves and wing edges should be checked for cleanliness and close fit. It is at this stage that you can begin to improve your plastic model by removing any excess "flash" and by careful use of a very sharp knife and small file, the joints can be cleaned before cementing. In the case of the fuselage halves, it is sufficient only to know that the two sides meet with a perfect seal. Any flash that appears in the form of a ridge is best removed at a later stage after assembly. With the model in this dry stage ready for breaking down again and final assembly, view it from the solid modeller's viewpoint and the accurate scale aspect.

The undercarriage wheel doors may be moulded too thickly for scale and you might feel that it would be better replaced by one in thin brass or tin. The cockpit canopy may seat on the fuselage

PART 1: NOTES ON MAKING THE LATEST PLASTIC MODEL KITS

like a pimple on a haystack and calls for bevelling the inside edges to bed itself right down with a more perfect joint. The u/c may be included in the "down" position yet the u/c doors appear closed on the model—so why not cut away the doors which should be open. A football-shape pilot's head projects simply from a solid shape made to represent the cockpit interior. Why not cut away this area and fit interior details, perhaps an ejector seat and dummy controls?

Surface improvements

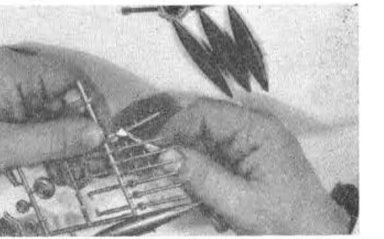
Jet pipe orifices are not always finished cleanly, and are sometimes actually left blank—these can be cleaned out with a set of twist drills used as reamers, gradually working up to the correct interior diameter. Then there are the rivets. On some kit models the manufacturers admit that they are more akin to those applied to the products of Clydeside. Progress in the Tool Makers Department has now overcome this problem, for in the first place, it was a case of big rivets or just a mess of irregular bumps. Those who selected earlier kit types can remedy the situation by careful use of wet-and-dry paper, 320 grade, finishing off by erasing scratches with 400 grade. Wet-and-dry paper is obtainable from most garages and cellulose finishers and by virtue of its waterproof backing is used with soap and water lubricant.

By now we have some idea of the list of improvements we would schedule for our plastic model and it is a good suggestion that the various improvements are interposed between the "step-by-step" stages in the printed instructions so that the builder has a clear impression of the assembly sequence.

Most cement tubes are lead alloy products with bulky nozzles which do not allow close application of the liquid in tight corners and on intricate components. Prepare the tube with a sharp knife blade, cut through the soft lead nozzle so that a chisel edge is formed. This can still be effected without piercing the tube so that a simple pin can be used as a stopper. Once assured that the joining surfaces are cleaned and free from flashes, one should be prepared to apply the cement quickly in one swift movement along the edges, etc., in order to apply the smoothest possible layer of the adhesive. A tip here is to squeeze the cement tube so that most part of the fluid will be ejected on the interior of the model between surfaces and, of course, one should endeavour to use only the minimum coating. For Polystyrene cement fuses the two surfaces together quickly and only the thinnest smear is necessary.

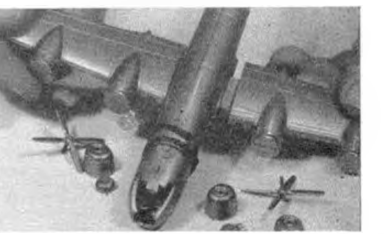
In the case of the wing surface, join together with a series of clothes pegs of the sprung variety, to hold the edges tight whilst drying, but care should be taken to see that excess pressure is not applied on one spot leaving perhaps the tip to open itself on the other end. In the case of the engine nacelle, where it is impossible to get clothes pegs around the diameter, rubber bands suffice. In all cases, remove excess cement quickly and smoothly.

(*continued overleaf*)

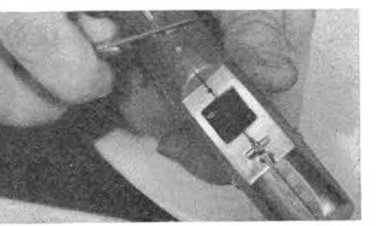


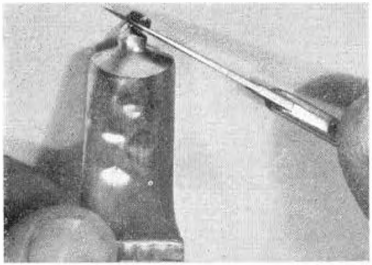
Special care should be taken when removing components from moulding stems. A pair of tweezers can be used to obtain a grip close to the breaking joint. Example shown is the Lindberg Super Sabre, where parts are so numerous it is better to detach from stems as required

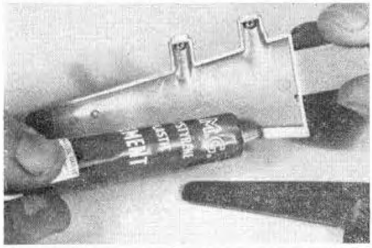
Above, a Frog Comet series Thunderstreak fuselage being joined with three clothes pegs, but one serving to seal the fin halves. Below: The Revell Superfortress is too large for clothes pegs, calls for tight rubber bands around fuselage. Here, wing joints are being checked before cementing

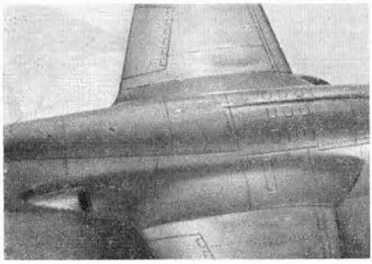


When fuselage halves are joined, the ridge line often spoils the scale appearance. This can be removed quite easily with a very sharp knife, scraped at an angle to the surface. Do not attempt to cut, nor use sandpaper until very last hairline has to be removed. Subject is the Lindberg Convair Pogo









Removing ridges

The same notes also apply to the fuselage, but it is inevitable that ridge lines will appear where the two halves join and these can be carefully removed by scraping with a sharp knife or backed razor blade with the blade across the fuselage at about 60 degrees to the work. This avoids the risk of scratching the finished surface, and when near to the desired finish, one can get to work with wet and dry paper, grade 320 and 400 wrapped around a small backing stick of balsa.

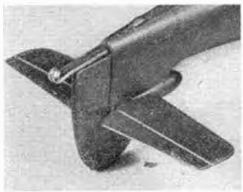
An illustration of the fine degree of realism that can be attained by this process is shown at bottom left, where a Frog Seahawk has been rubbed down on the fuselage topside, up to a point level with the mid-point of the wing chord. This same photograph also serves to show another characteristic of the plastic kit model that would not be reproduced on the solid model maker's carved product. We refer to the panel lines, which are proud of the surface. They add considerably to the sales appeal of the model kit, and are in the main most accurately positioned, yet to the fastidious modeller's eyes they protrude rather too much for what are in reality, flush butt joints, internally flanged or the more common joggled joints. Here, again, a light rub with 320 and 400 grade papers will reduce the lines slightly, and also takes the light reflecting sheen off the panel lines to make them less obvious.

Wheels are reproduced to a very high standard in most makes of plastic kit: but unfortunately the plastic has to flow into the mould for the wheel somewhere on the tyre, and this means that after detaching from the moulding "stem" there is a blemish to remove. Rub the tyre with 320 paper; this will give the correct dull effect when painted later.

If the model happens to be a tricycle u/c type, the manufacturers may or may not have included small lead weights in the kit which should be placed in the nose to allow it to stand correctly on its u/c. These can easily be cemented in place, before joining the two halves.

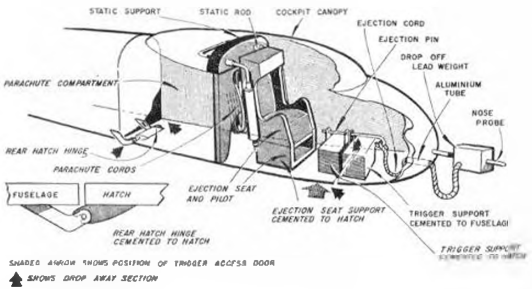
Similarly, one should decorate the interior of the cockpit before assembly, but this is breaking into the painting and finishing stage which deserves a full article in itself, and will be dealt with extensively in next month's continuation of this feature.

Modelling tips: Top to bottom (1) Cut the cement nozzle to a bevelled edge. (2) Apply adhesive quickly and neatly away from outside edge. (Lincoln 1 iscount wing shown.) (3) Cut away undercarriage hole (Frog Seahawk) and cream out jet pipes with a twist drill. (4) Centre ridge line can be scraped away, then rubbed off with wet-and-dry paper. This Seahawk fuselage shows before and after effect. Below: Replacement of large plastic arrestor hook with bent pin, before and after



EJECTION GEAR FOR MODELS

By P. Champion



THIS IS A DEVICE which can also be used for the ejecting of equipment other than that of a model pilot and seat and it is presented as a novelty at the most.

The idea is that should the model dive, stall or behave in such a fashion that will finally result in a crash, the ejection device will eject the "pilot" or other equipment (which is not expendable) safely to the ground by parachute. (*Radio equipment?*—ED.)

A lead weight on the nose probe slides off the probe pulling the ejection cord and jerking the pin free from the mounting. Then the weight of the pilot and seat forces the hatch down and backwards, and with the rear hinge shape as sketches, this enables the hatch to fall free.

Parachute lines are coiled on top of the parachute in its compartment and the weight of the seat plus the length of the lines, jerks the parachute free, the whole operation taking less than one second.

Ejections have been made from 75 to 200 ft. and the nose probe inclined at such an angle that only violent disturbances will cause the ejection device to operate; on test this was done by trimming the model for a violent stall.

The parachute should be tightly packed to allow a smooth operation. THIS IS IMPORTANT.

Ejection seat used was 3 in. high by 1½ in. wide and coloured in black and white chequered markings for visibility. This was found to be unnecessary. The pilot was made from balsa and dressed in a leather flying suit. The parachute is circular and 30 in. in diameter with a stability hole in the top of 4 in. diameter. This could be a little larger. Edges are bound with bias binding and the eight lines are sewn and cemented in position. The seat is made from four ply hardwood and balsa.

Static rods on the seat support from 20 s.w.g., but would be better if made from a thicker wire. This is bent to shape and mounted through the aluminium tubing in the static rod supports. The ends of the two static rods being ⅛ in. from the hatch.

Small pieces of balsa are notched and the aluminium tubing is cemented into these which are in turn mounted, one on either side, of the ejection seat, so that the seat slides upwards into the cockpit. This is done by holding the fuselage upside down and sliding the seat on to the rods. Next, the parachute is packed into the parachute compartment, immediately behind the pilot. The compartment in this case measured 2½ x 2½ x 3½ in. high.

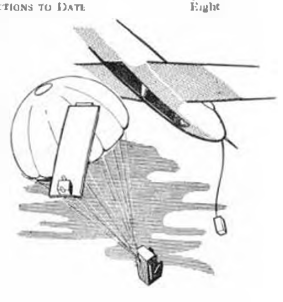
The parachute lines are then coiled on top and the hatch fitted into position holding the pilot and 'chute in position. The model is then turned the right way up and the ejection pin is then placed in the mounts through a small door on the port or starboard side.

The ejection cord is then threaded through an aluminium tube in the nose, on the end of which is the lead weight, itself drilled to slide on to the nose probe.

It may be found preferable to attach the hatchway to the model to prevent loss, but on the original model it is allowed to fall free.

Data:

ANGLE OF SAFE EJECTION		0 deg. to minus 75 deg.
TESTED OPERATING WEIGHT ON HATCH COVER		4 oz.
SEAT, PILOT AND 'CHUTE WEIGHT		2 oz.
RELEASE GEAR		1 oz.
'CHUTE LINES	8 at	3½ in. long
LENGTH OF EJECTION CORD		12 in.
NUMBER OF EJECTIONS TO DATE		Eight



Away she goes! This ejection system can be used for other items—if need be.

World News

FROM **South Africa**—where we learn that there is every possibility of the Easter Nationals being shifted from the "Windy City" Port Elizabeth to an up-country site—a top class modeller writes about the A/2 results. "Where," he says, "are those three-minute models we hear so much about—they never turn up at the Championships." How we well understand such a query, having seen the magic three-minutes executed so slickly in mid-European dead air, when we ourselves could barely break 2 : 10 with a considered "good" glider back in Bedfordshire.

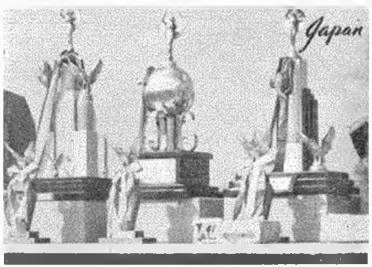
The answer is, of course, that when thermal conditions prevail, the luck element always elevates the less clever, and downdraughts the super-efficient types. Such was the case at Florence and that is where the overall team championship counts so much, for by the simple law of averages, it mixes good with poor and always finds the better-equipped nation regardless of the top individual position, and in case you did not notice it, the **Czechoslovakian** team had all four of their men in the first eleven places at Florence in A/2.

That the three-minute model exists in the A/2 class could not be better exemplified by Hansheiri Thomann's magnificent win in the ten-round (yes—10 flights!) Nationals at Birrfeld, **Switzerland,** on November 3/4th. Lowest time he made was 2 : 20 and he had six flights over three minutes. Total duration was 1,731 sec. out of the possible 1,800. Now you go out and make that time in ten consecutive flights with an A/2 off 164 ft. of nylon!

Thomann, who comes from Frauenfeld, is a remarkable modeller who narrowly missed being this year's World Champion. Concurrently with this Swiss A/2 meeting the power event also ran over ten rounds, and top two placings, Rudi Schenker and J. Schiltnecht, were near to the maximum possible total with 1,742 and 1,741 sec. respectively. Both had eight out of ten maxs, Schenker losing a 9th by only one second.

In **France** the debate is on "Should we continue to enter World Championships?" A resolution has been passed (on October 28th) that should the 400 gramme rule not be adopted, then France should *not* participate in the F.A.I. Championships. Since then, the F.A.I.

GERMANY, latest product of Hans Gremmer's vane-magnet glider stable is this new one with long nose moment and high aspect vane. HUNGARY, a scale Gerle 13 by J. Mona about to fly over the drained ornamental pool in Budapest, used for Internationals. ARGENTINE, champion r/c flyer Iriarte and his "Telemaco" with telescopic struts for reversing dihedral when inverted. U.S.A., a Navy Carrier event PWC-2 by Capt. McGuinn of Fort Eustic, Virginia, also has airship hook-on device. JAPAN, the Wakefield, t/2 and Power cups with appropriate replicas for individual Champions at Japanese trials



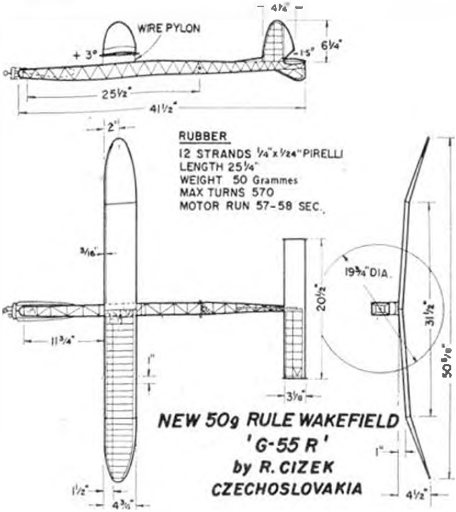
decided on 300 grammes per c.c., so it seems that we'll not be having France at Cranfield in 1958. Pity; we missed them in 1956. French modellers were equally keen that the 2·5 c.c. engine limit be retained and relieved to see the defeat of the 1·5 c.c. proposition—like most of us. Maurice Bayet comments on these items in his "*Modele Reduit d'Avion*" and recognised the high degree of engineering skill that is now needed for a 2·5 c.c. racing engine in the speed class and the difficulties facing the French modeller in keeping up with the pace. We suggest he urges support of Jarry-Desloges whose engines only need a larger airframe to become the "Carters" of France.

In **Japan** the Championships for the three F.A.I. F/F classes resulted in familiar names Hujikawa (Yokohama) and Suzuki (Hammamatsu) placing top in A/2 and Power, with T. Sato of Yokosuga making a full maximum score in Wakefield. Durations for Power and Wakefield in these All-Japan events indicate a keenness parallel to that in Britain; but in A/2, times fall off quickly beyond fifth place. Gliders follow the Hacklinger/Lindner school of thought with dihedralled tailplanes and large wing dihedral angles.

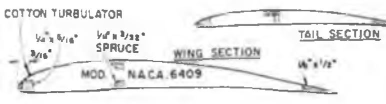
Brisbane (N.M.A.A.), Warwick and Stanhope are three Queensland clubs that held a tri-cornered C/L event on November 25th. Writing of his 100-mile trip there through both wild and cultivated **Australia,** Arthur Gorrie offers some quotable comments which we are sure will be appreciated by all who have travelled far into the night to get to a Model Meeting: ". . . after testing our models (foolish thing to do)"—". . . morning sped by faster than my Team Racer"—"R/C seems too complicated for the ordinary chap"—and ". . . we lost valuable hours sleep the night before getting the things right the night before". Outcome of this meeting was, we hope, a lasting "impression" on the township of Warwick of the true values of our absorbing hobby and its associated virtues.

Twelve months of serious preparation have resulted in a new World Duration record for R/C Gliders by Dr Bob Chase. Cliff soaring for 8 hours, 34 minutes and 21 seconds at Torrey Pines, California, U.S.A., Doc Chase's glider could well have gone on for another 8 hours: but the wind and human body were failing and the model had to be brought down close to the 27·255 m/cs. transmitter. About 2,000 signals were sent and 1,000 complete turns executed during the long flight. Model was one of three over the 400-ft. cliffs, others soared for 1 hour and 4 hour sessions.

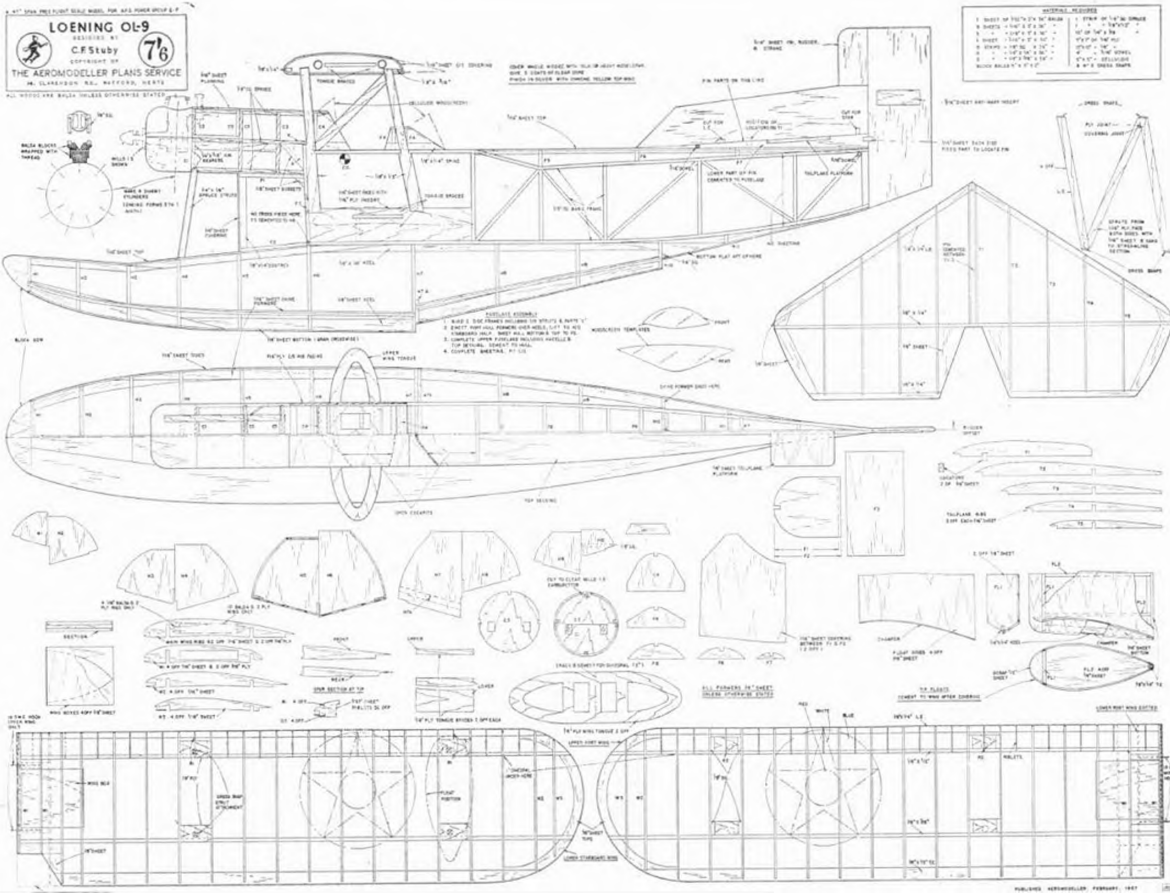
CZECHOSLOVAKIA, a fine scale model of the Meta Sokol with full internal detail, by Kolara. MALAYA, F/Sgt. Robert of RAF Seletar designed this novel delta, with buried engine and prop in slot as on A.P.S. "Prop Secret." Construction is mainly 1 in. sq. and full crew came from American plastic car kit



NEW 50g RULE WAKEFIELD
'G-55 R'
by R. CIZEK
CZECHOSLOVAKIA



Prominent Czech Wakefield exponent, Radoslav Cizek, has been trying the 1958 Wakefield formula with this model. Time average from a 55 sec. motor run is 3:05


LOENING OL-9
DESIGNED BY
C.F.Stuby
COPYRIGHT BY
THE AEROMODELLER PLANS SERVICE
96, CLARENDON RD., WATFORD, HERTS
7½
MATERIALS REQUIRED
ALL WOODWORK BALSA UNLESS OTHERWISE STATED
PUBLISHED AEROMODELLER, FEBRUARY, 1957

LOENING OL-9

Build this scale flying boat for 1.3-1.5 c.c.—by C.F. STUBY

THIS PARTICULAR model is unusual for three reasons. Firstly, it comes from an American modeller resident in Bangkok, Thailand, secondly, it is a model flying boat that can be flown over grass or water, and thirdly, it is of a subject that represents a romantic era in the history of U.S. Naval Aviation.

To be technically accurate, the OL-9 *should* be called an amphibian, and it also could be known as the Keystone OL-9, for the Loening Corporation was merged with Keystone in 1928, and the aircraft was in full production under that company's name during '32 as a "high speed" two-seater, with facilities for carrier deck landing and stressed to withstand catapult launches. Our model should actually carry dummy wheels projecting from the hull sides, if it is to be made for scale model contests, and reference to *Jane's All the World's Aircraft* for 1929 and 1932 will provide illustration of further detail for the avid scale fan.

The name of Grover Loening is linked with that of Glenn Curtiss and the Wright Brothers, as one of America's early pioneers of the air. With L. R. Grumman as Chief Engineer, the Loening company produced a number of amphibians on the single float principle, and these appeared in Army, Navy, Ambulance and Commercial guises. The OL-8 and OL-9 were much alike in general form, and for aeromodelling, the long hull, generous areas and dihedral make it a fine scale selection.

C. F. Stuby who made this 1 in. to 1 ft. prototype, is so enthused by its over-water performance that he contemplates a 1½ in. to 1 ft. version with full radio control. Flying speed with a Mills 1·3 c.c. diesel up front is slow, and the shallow climb makes a full-tank power run feasible when there's not too much wind to cause drift. It will take off from smooth water on much less than full revs, and thanks to the long nose on the hull, it will never do anything other than alight upright, either with power on, or off!,

On two occasions, a bad hand launch caused the OL-9 to settle down on to the water and on both times, it recovered perfectly into a beautiful R.O.W.—and there are not many flying boats or seaplanes that will do that! Another time, the original 18 ounces weight was almost doubled by water taken into the surfaces through a hasty dope job after re-covering the wings, yet the only effect on the flight pattern was to create "roller coaster" action due to the water sloshing back and forth, lateral stability remaining perfect.

The designer adds the following advice on trimming and if one applies just a little imagination in interpreting these hints, then one can readily understand why the flying boat is so attractive a modelling subject, particularly when it is a scale model such as the Loening. It is recommended that the test glides be conducted over shallow water. As the glide is relatively slow, and the gliding angle flat, the OL-9 touches down about 20-25 ft. ahead of the launching point and usually skips once before settling. Test with half power, and at the rudder offset shown on the plan;it is directionally neutral and flies in a wandering pattern, making both left and right hand circuits of large diameter. On one occasion it actually flew a figure eight! The flight attitude is slightly tail-down and in a breeze, it tends to hang into wind. Should the turns show a distinct left bias, apply engine offset of up to 3 degrees right thrust to get that wandering pattern which is so much more satisfactory.

A complete change from the usual run-of-the-mill scale subjects, this Loening will fly equally well over grass or water. Engine and prop are protected by the long hull and construction allows fully "crash proof" knock-off wing fixing. Full size copies of the 18th scale plan opposite are available price 7/6 post free from AEROMODELLER plans Services. Quote Plan No. FNP 630 when ordering

PROPELLER BREAKAGE is one of the lesser expensive risks a power model flyer has to contend with, but over a season's flying can often make considerable inroads on the pocket, not to mention the time sometimes apparently wasted in polishing "specials".

Usually, the greater proportion of the breakages involve only one blade, the other blade and the hub being more often than not completely undamaged.

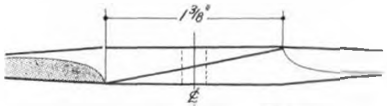


Fig. 2. Typical joint for 8"x4" Prop.

Safe Power Prop Repairs

By J. G. WALDRON

It does become apparent that if a pair of these undamaged blades can be joined, the life of a propeller can be doubled or trebled, and having succeeded in doing this, with propellers of up to 9 inches in diameter used on some of the most powerful 2·5 c.c. engines available, the writer here offers his own methods.

The over-riding considerations with any propeller repair are as follows:

1. SAFETY.—A blade must not be capable of shedding itself.
2. ACCURACY.—The pitch of both blades must be the same.
3. SIMPLICITY.—Method of joining the blades must be as simple as is reasonably possible.

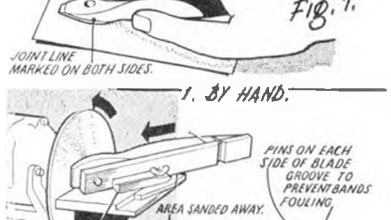
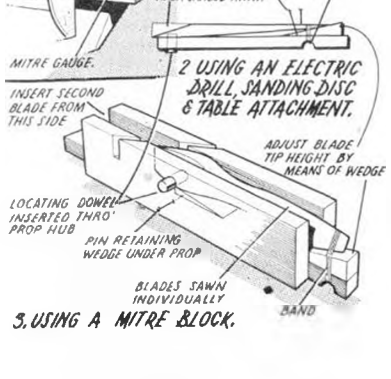


Fig. 1.



The only method complying with these three requirements is to splice the two halves together across the thickness of the hub, the engine shaft passing through part of each blade, and this ensures against blade shedding. For the same reason only propellers with undamaged hubs must be joined.

The hub, together with the strength of the glued joint take care of centrifugal loads, the only other thing to guard against is the shearing apart of the two halves, principally when starting the engine.

Get Maximum Gluing Area

Shear strength of the joint is dependent on the quality of the adhesive and the area of the adjoining surfaces, this assuming that these surfaces fit well together. As the joint is being compressed by the prop-retaining nut, it is not necessary to bind it. However, as an additional precaution, two hard-wood dowel shear pegs are inserted across both ends of the joint.

Methods of cutting the blade root are shown in *Fig.* 1, the fastest of which is undoubtedly number two in which one of the popular electric drills with a sanding table attachment is used, but the other two methods give equally good results.

With the sanding table an accurately made guide block is necessary, having the lower and side faces "square" relative to one another. With the mitre block method accurate cutting of the guide slots is necessary, while with both of these methods accurate setting up of the blades is essential.

When chamfering the blades by hand, care is necessary to ensure accurate marking of the joint line.

For maximum strength, the angle of the joint should be kept as fine as the hub diameter will reasonably allow, a typical joint length for an 8 in. x 4 in. "Prop" being shown in *Fig.* 2.

With the root portions accurately chamfered, assembly is quite straightforward as shown as *Fig.* 3.

After gluing, a short dowel is temporarily inserted in the shaft hole in order to prevent the two halves

sliding apart while under pressure. This dowel should be waxed in order to prevent adhesion to any surplus glue.

Do Not Use Balsa Cement!

For adhesive use one of the waterproof resin glues, such as of the "one-shot" powder variety, as these are less likely to be affected by fuel; definitely do *not* use cellulose cement. A good cabinet-maker's glue would do, but these are not fully waterproof, and would require considerable fuel-proofing of the hub.

Since wood densities vary, it is a good plan to roughly check the balance of the resulting propeller before doping and final balancing, a little judicious sanding can often save a lot of dope and patience.

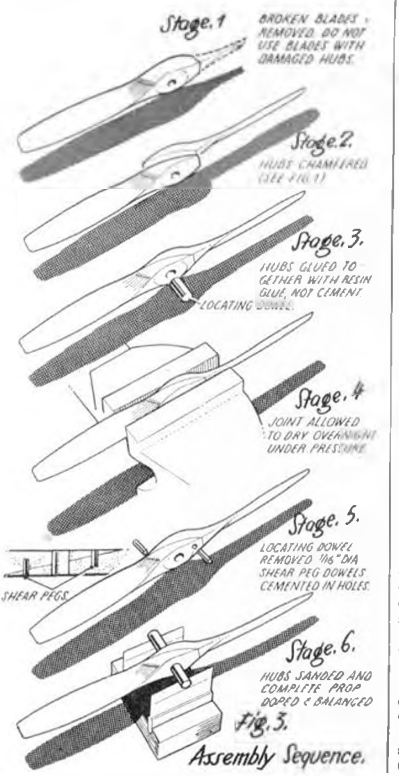


Fig. 3. Assembly Sequence.

Bruce Fergusson explains badges and coats of arms

DURING THE First World War pilots of the Royal Flying Corps Squadrons and their mechanics used to paint devices on the sides of their aircraft. This custom proved to be extremely popular and more and more squadrons copied the idea. So popular, indeed, had this craze for squadron badges become that in 1935 it was decided to bring the practice under control. In that year the Chester Herald, Mr. (now Sir) John Heaton-Armstrong, was appointed Inspector of R.A.F. Badges.

Immediately regulations for the registration of all Badges in the Royal Air Force were made and, at the same time, a standard type of frame was insisted upon. It was agreed that, inside the frame, individual designs could be emblazoned. A small charge was made to each Unit to cover the cost of the design, the registration and the preparation of a copy for Royal Approval.

In order to qualify for a Badge a Unit must have been in existence for two years. The Unit has to prepare a design and submit it to the Inspector General for approval. On receipt he examines it to make sure that, heraldically, it is correct, and then a search is made in the archives to see that the design has not been used before. If the badge "weathers" this severe scrutiny the Inspector has a copy of it made, within the standard frame, and it is sent to the Chief of the Air Staff. Once again the badge is scrutinised and, if passed, goes back to the Inspector General who instructs his staff to prepare a painted copy for the Royal Signature. In the preparation of the copy which is submitted to the Queen real gold leaf is used.

The first group of R.A.F. badges was approved in 1936 by King Edward VIII (now The Duke of Windsor), but in 1929 the R.A.F. College at Cranwell received a "*Grant of Arms*".

When considering the subject of Coats of Arms and the like it must be remembered that "Arms" can only be borne on a shield or, in bygone days, on the surcoat of the owner, whilst a "Crest" is always associated with a helmet.

Therefore, as Cranwell is a permanent institution, with a plate upon which a Coat of Arms could be displayed, the Coat of Arms was granted.

The Central Flying School also possesses a Coat of Arms which was granted in 1931, and a third Coat of Arms is being prepared for the R.A.F. Flying College at Manby. This means that there are only three R.A.F. institutions which bear Coats of Arms of their own.

FAMOUS BIPLANES
No. 7 by G. A. G. COX

Handley Page HEYFORD

THE HANDLEY-PAGE "Heyford" was designed to Air Ministry Specification B32/32, and was the standard heavy bomber of the Royal Air Force in the middle 'thirties.

This aircraft was described by its makers as an "express" bomber, not by virtue of exceptional speed, but because it was designed specifically for rapid servicing between sorties. The high engine mounting enabled the armourers to reload the bomb bay in perfect safety while the engines were running. The side panels of each engine nacelle let down to form working platforms, and although fuel was stored in the upper centre-section, the refuelling point was located in the lower wing, thus obviating the need for special ladders.

The unusual fuselage location gave the crew a field of vision hitherto unknown in a bomber and this, with the wide field of fire enjoyed by the gunners, combined in the "Heyford" some of the advantages of a monoplane with the manoeuvrability of a biplane.

The "Heyford" was powered by two Rolls-Royce "Kestrel" engines of 600 h.p. and its loaded weight was 16,750 lb. The maximum speed was 142 m.p.h. at 13,000 ft. The service ceiling was 21,000 ft. and the range 920 miles.

Building the Model

1. Following the instructions for the Albatros model, saw the fuselage halves from $\frac{1}{8}$ in. hardwood. Drill $\frac{1}{8}$ in. holes for the gun positions and $\frac{1}{4}$ in. holes for the windows, then shape to the correct sections.

2.(*) Unscrew the halves and hollow the starboard side where indicated. Coat the inside surface with paint and press on to the other half to print the hollowing line, but leave a platform at the pilot's position.

3.(*) Line the inside with frames cut from thick paper to represent the fuselage framing. Paint the interior pale green and add all the details.

4.(*) Make the "dustbin" turret as shown from dowel and card. Wind an elastic band round it until the glue is dry, then cut the aperture. Make a shallow groove in one fuselage half to take the piano wire ejector spring. (Pressure on this spring will push out the dustbin from its fully retracted position.)

5. Cut a rectangular hole for the W/Op's window, locate the "dustbin" and spring and assemble the fuselage.

6. Remove the spare wood from each end, finish shaping the ends, then carefully cut out the bomb-aimer's window.

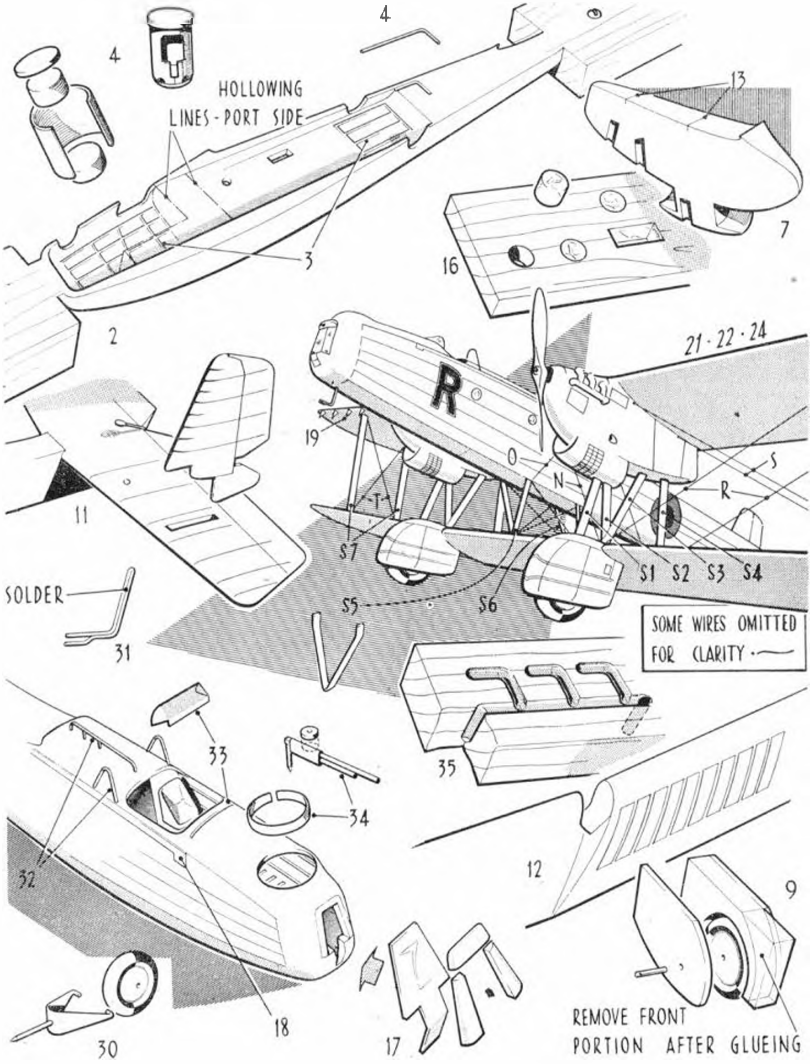
7. Cut four engine nacelle halves from $\frac{1}{4}$ in. wood and drill holes for mounting the exhausts before shaping. Separate the halves to hollow the radiator, and before glueing together cut recesses to take the struts.

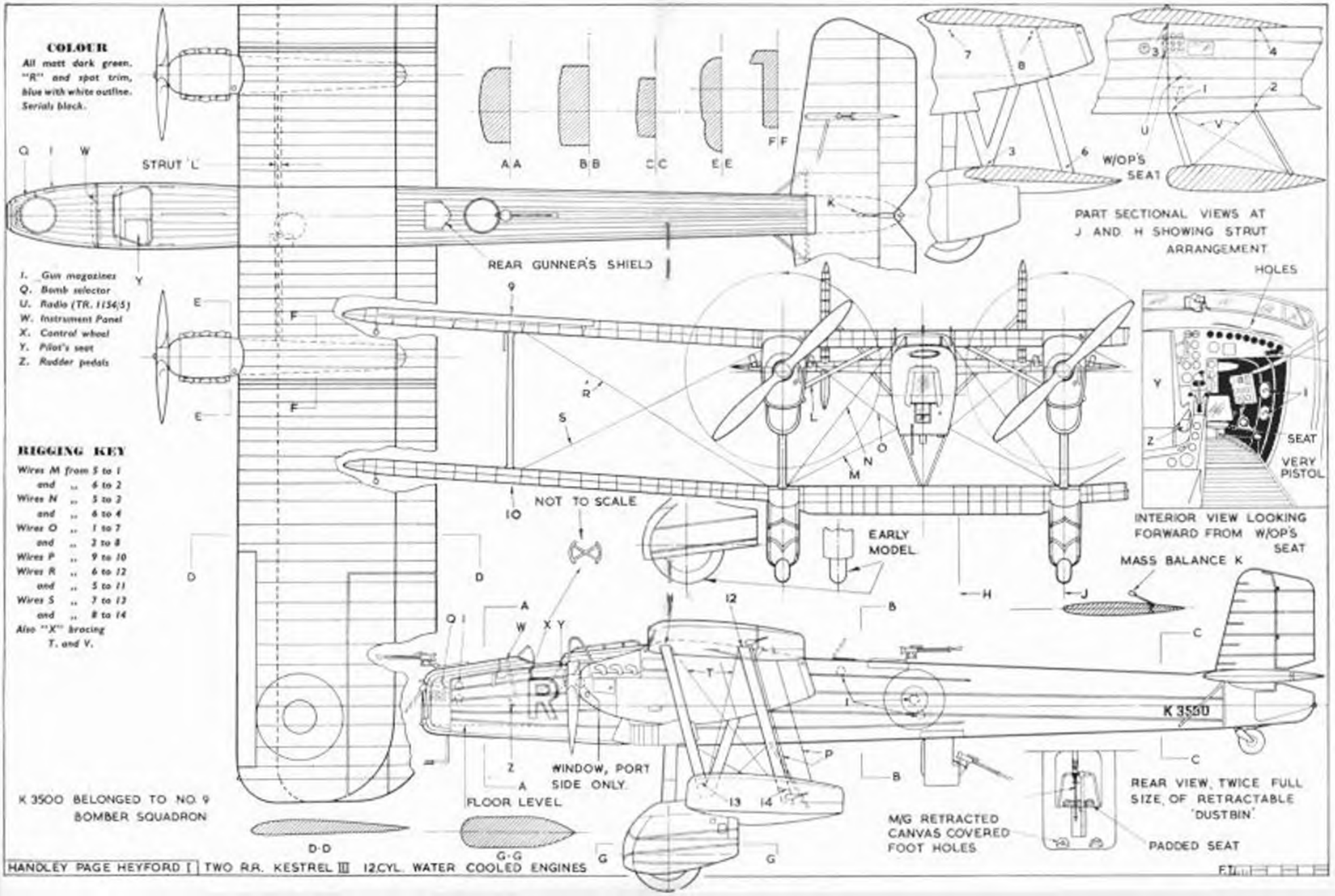
8. Make wings from $\frac{1}{16}$ in. hardwood, but don't give dihedral at this stage. Because of the small scale and close spacing of the ribs no fabric sag was attempted in the model shown. Wrap glasspaper *tightly* round the upper wing and use this as a sanding block to achieve a perfect fit with the fuselage and nacelles.

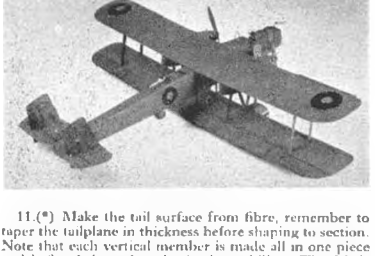
9.(*) Cut the spat components from $\frac{1}{4}$ in. hardwood and $\frac{1}{16}$ in. fibre. In case of fracture, leave the front portion until the layers are glued. Make the wheels, paint them matt green and matt black, and assemble the spats, using brass wire for an axle. Shape the outsides with chisel and file.

10. Seal the grain of all parts, then score all panel and wing rib lines with a modelling knife. Make vee cuts on the upper surface of the wings, crack and glue to give dihedral. Mark the ailerons with vee cuts, and drill holes for all struts, the aileron mass balances, navigation lights and aileron wires. Groove for aileron horns.

The Heyford brings back nostalgic memories of pre-war RAF displays and "open days" at aerodromes throughout the country. Charles E. Brown's heading photo of the huge dark green bomber out on gun firing practice shows the version modelled so well by George Cox (below left). At right is an earlier version with variations in engine cowl and spat outlines


4
4
HOLLOWING
LINES - PORT SIDE
3
2
13
7
16
21 · 22 · 24
R
19
O
N
T
S
R
S7
S1 S2 S3 S4
S5
S6
11
SOLDER
31
SOME WIRES OMITTED
FOR CLARITY
35
33
34
32
18
30
17
12
9
REMOVE FRONT
PORTION AFTER GLUEING


COLOUR
All matt dark green. "R" and spot trim, blue with white outline. Serials black.
STRUT 'L'
Q I W
Y
1. Gun magazines
Q. Bomb selector
U. Radio (TR. 1154/5)
W. Instrument Panel
X. Control wheel
Y. Pilot's seat
Z. Rudder pedals
RIGGING KEY
Wires M from 5 to 1
and " 6 to 2
Wires N " 5 to 3
and " 6 to 4
Wires O " 1 to 7
and " 3 to 8
Wires P " 9 to 10
Wires R " 6 to 12
and " 5 to 11
Wires S " 7 to 13
and " 8 to 14
Also "X" bracing
T. and V.
A A
B B
C C
E E
F F
D D
G G
D-D
G-G
REAR GUNNER'S SHIELD
NOT TO SCALE
EARLY MODEL
W/OP'S SEAT
PART SECTIONAL VIEWS AT J AND H SHOWING STRUT ARRANGEMENT
HOLES
SEAT
VERY PISTOL
INTERIOR VIEW LOOKING FORWARD FROM W/OP'S SEAT
MASS BALANCE K
K 3500
WINDOW, PORT SIDE ONLY.
FLOOR LEVEL
M/G RETRACTED CANVAS COVERED FOOT HOLES
REAR VIEW, TWICE FULL SIZE, OF RETRACTABLE 'DUSTBIN'
PADDED SEAT
K 3500 BELONGED TO NO. 9 BOMBER SQUADRON
HANDLEY PAGE HEYFORD I | TWO RR. KESTREL III 12CYL. WATER COOLED ENGINES



George Cox's 1/72nd scale Hayford was authentically painted with the new O-My matt enamel, produced in 1-ounce packs for the plastic kits. Cockpits are fully equipped, and the "dustbin" retracts

11.(*) Make the tail surface from fibre, remember to taper the tailplane in thickness before shaping to section. Note that each vertical member is made all in one piece and is fitted through a slot in the stabiliser. The fabric sag at the fin L.E. is a prominent feature of the "Heyford", and should be made with a round needle file. Drill holes for the bracing struts before assembly.

12.(*) Build up the thickness of the lower centre section with sheet balsa, sand to shape and score 10 small bomb doors. With a fretsaw cut away the L.E. to take spats. Glue these in position and smooth the joint with glasspaper or a very fine file.

13. Give all surfaces a coat of dark green matt paint. "O-MY" enamel gives a first class finish, dries in 15 to 20 minutes and only one coat is needed. Make saw cuts across the tops of the nacelles, and in each one glue a 10-inch length of dark green thread; these threads will become bracing wires S, O and M. Glue the nacelles to the wing, and fillet at the L.E.

14. Add the spat trim and "R" to fuselage. A method even easier than home-made transfers is as follows. Place thin acetate sheet over the drawing, and stick clear Sellotape on to the acetate over the "R". Trace round the outside of the letter with a pointed blade, cutting through the tape only. Peel off the surrounding tape and press firmly on to the fuselage. (The centre portion of the "R", too, if desired.) With a fine brush and white Humbrol enamel paint round the edges of the letter, giving $\frac{1}{16}$ in. of white paint to the model. Peel off the tape and fill in the letter with blue.

15. Print the fuselage serial with Indian ink, then file brass wire to an oval section and fit tail struts.

16.(*) Drill $\frac{1}{4}$ in. holes in $\frac{1}{4}$ in. scrap hardwood then file a strip of Perspex into a rod which fits tightly into these holes. Cut $\frac{1}{8}$ in. lengths of rod, tap into the holes and sand both ends flush with the surface of the wood. Polish with "Ajax" and "Silvo", then remove. You should now have three cylinders of Perspex highly polished at both ends. Colour the insides of the window holes with Indian ink, then tap the windows into place. Repeat the process with the rectangular window.

17.(*) Cut a bomb-aimer's window from acetate sheet and fit to the nose; add framing of wood, and paint green.

18.(*) Cut the fairing strips from card, glue to the fuselage sides and paint.

19.(*) Saw slots in the upper L.E. to take celluloid slot lever housings. Mould a 1-inch strip of celluloid round the L.E. by holding near an electric fire, then cut to the correct width. Roughen the inside surface by scratching with a knife, so that glue will hold it in place (cement would distort the celluloid). Paint the slot assembly green.

20. Fit brass or bamboo "L" struts. Make razor saw cuts across the top of the fuselage at 3 and 4 and glue the centre of a 20-inch length of thread into each. (These threads become wires N, R and T.)

21.(*) Make about 18 in. of strut material from bamboo or hardwood. Cut the struts S1, fit into the appropriate holes, then check for length. Do the same with struts S4. Assemble the model with elastic bands, check the gap and stagger at both wing tips. When this is satisfactory, glue the struts into the *nacelles only*, and leave assembled until dry. Repeat the process with the struts S3, then S2. All but S3 should extend a good distance into the nacelle, giving a perfectly rigid structure.

22.(*) Bend the struts S5 and S6 from flattened wire to fit the model, then cut the interplane struts S7.

23. Glue a 3-inch thread into the holes 1 and 2, then insert the struts S5 and S6. Assemble the model to angle these correctly while the glue hardens. Remove the lower wing, loop the threads around the bottoms of S5 and S6 and glue. (Don't pull the threads too tightly in case the struts are pulled out of alignment.) Trim off the surplus thread.

24.(*) Make razor saw cuts at the ends of S3, S4 and S7. Take threads 0, loop round S5 and S6 and glue, then pass through the slots in S3 with threads N.

25. Apply glue to the holes for all centre-section struts, assemble the model with rubber bands and pull N and M tight.

26. On the starboard side pass R and S through the slots in the ends of struts S7. (Mark the top and end of each strut lest in the confusion of a network of threads you insert a strut upsidedown.)

Glue the strut holes and pop the struts into the *upper* wing. Pull the threads R tight, cross over, pass through the slots in the lower strut ends, then fit the struts into position. Pull T and S tight and trim off.

27. Repeat this procedure on the port side.

28. To make a mass balance, hold a pin head-downwards in pliers and load with solder until a droplet is formed. Glue into the holes in the ailerons and elevator.

29. Cut aileron horns from thin sheet brass. (The sleeve from an old plastic lampholder is fine.) Sink into a block of scrap balsa while soldering to it a length of 10 amp. fuse wire to represent the cable. Trim to size and glue in position.

30.(*) Make the tailwheel assembly, again from sheet brass, and add to the model.

31.(*) Make a pitot tube from 15 amp. fuse wire.

32.(*) Drill fine holes in the fuselage and fit wire handrails.

33.(*) Fit a windshield into a razor saw cut as shown.

34.(*) Cement strips of celluloid into the gun positions to form gun rings. Attach guns made from pins and brass. Colour the guns with silver dope to which a little black has been added.

35.(*) There are several ways of making the exhaust manifolds. Those on the model illustrated were cast in solder in a wooden mould. It is essential to tin the mounting wire first with a hot iron, then to drop a blob of solder on to the mould. The surface tension of the molten metal makes it impossible to fill the mould unless the iron is now allowed to cool off until it will work the solder in a semi-plastic state. If the iron is the correct temperature it will spread the metal like butter, and it is then possible to press it into the mould. File the casting level with the surface of the wood, then remove and round-off the sharp edges with a needle file or knife.

36. Add a celluloid gunner's shield, and carve the propellers from fibre.

37. Mark the roundels with dividers and paint these and the wing serials.

TRADE NOTES

THOUGH A GOOD many retail traders can claim longer existence than ten years, few can match the progress and commercial success of **Henry J. Nicholls Ltd.** during the past decade. Henry J. opened house to his friends and associates in the trade on December 6th, for a celebration of his tenth anniversary in Holloway Road, and it was an occasion for reflection on the many things that have happened in the model business during that time. From the temporary shop-front days, with war-time damage awaiting its turn for timely repair, to the present day well-furnished hobby centre, it has been a story of struggle, setbacks and success. Nicest atmosphere that Henry maintains so well at "308", is the constant provision for the enquiring visitor who likes to see something really different. A strange foreign engine from the H.J.N. "museum", an outstanding Milani scale model suspended just above head height, or an enviable glimpse at the full range of radio control accessories in the glass case—that is the kind of service, complete with the most expert advice from behind the counter, that has gone so far to make 308 a visitor's mecca.

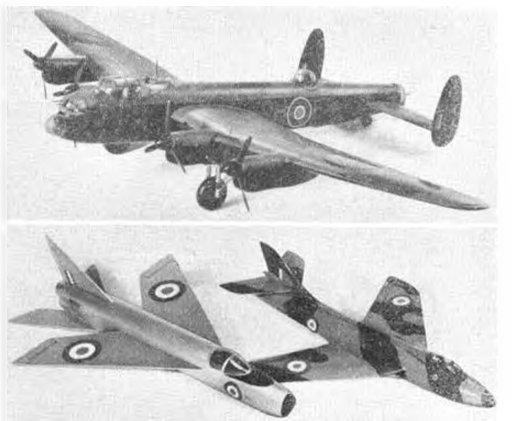
Messrs. **Model Toys Ltd.**, wish us to point out that the price quoted for their Lindberg plastic kit of the North American F.100 Super Sabre is 14s 11d. and not 17s. 11d. as mentioned in their advt., last month. Perhaps the most involved and detailed of all the single engined plastics, the F.100 has moveable controls and a detailed jet engine, with afterburner. This particular model lends itself well to the techniques described in our "Improve Your Plastics" feature beginning this month.

On the subject of jetplanes, latest in the tailored Mach 1 series by **Sebel Products**

Inside the latest E.D. Transitrol receiver, showing compact arrangement of components within 2½ × 1½ × 1¼ in.

for Jetex, are the English Electric P. 1A and Hawker Hunter at 10s. 9d. including tax (*Illustrated above right*). We have made these models and as before, cannot fail them on one single point. Kits include an augmentor tube, and mounts for a 308 unit, while all parts are ready shaped with first-class die-cutting and "moulded balsa" pre-formed fuselage halves. Third in the series, is the Gnat, reviewed this time last year.

It is very rare for a month to pass by without some new line from **Keilkraft**, and this time we have a set of British and U.S.A.F. flying scale model transfers at 9d. per sheet that will fill the bill for all the K.K. 3s. 9d. Junior Flying Scales and many another small model, 1/48th scale Bomber solids included. Four sizes of bobbin for rubber motors are also introduced by K.K., priced between 3½d. and 5d. in ½d. stages. Moulded in off-white plastic, they are nice and deep to prevent the rubber over-riding and should fill the bill for all who have found difficulty in getting this once very popular accessory.



AEROMODELLER test department models the solid Lancaster by C. P. Dixon of Compass Models, with full interior detail, and the latest Jetex Tailored pair, the E.E.P.1 and Hawker Hunter

In power contest circles, where a difference of ½ in. pitch on a propeller can make a high performance model get into the top class, the name of **Tiger Props** (*see p. 111*), is already familiar. Used by big names including the renowned Silvio Lanfranchi, for his famous Swiss Miss K, and E 15 combination, these props have been specially machined in limited number to satisfy requests from prominent modellers —and are finished to a standard that befits their purpose. There are four sizes at present, 8 x 3½ for high revving glow engines, 8 x 4 for diesels, either free flight or combat, 9 x 3 for hot stuff motors in

H.J.N. and Son? Not exactly—it's Henry enjoying our good wishes and commemorative donation on the occasion of his tenth anniversary at "308"

the 2·5 c.c. class, and 9/6 too, we should think, and a 6 x 9 that will give any 1957 speed team aspirants a good chance of success. Each prop is hand finished with three sandings and two coats of varnish, and the charge of 2s. 8½d. very fair indeed.

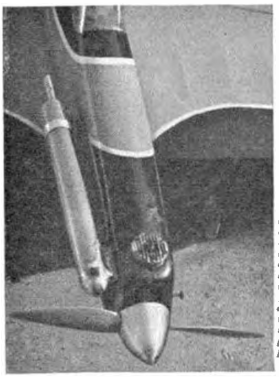
Whenever we receive a kit from **Veron**, we are forced to remark on quality and value for money. The Deacon, big brother for the well established Cardinal, is right up to the last possible standard in kitting, and at 34s. 6d. for 52 in. span, either as a sport, PAMoal, or r/c model, it is fine value. First-class die cutting for the ribs, fine line printing for the few parts that have to be cut out, rubber tyred wheels (a trifle small though) and as usual an explicit Phil Smith plan, will make this model a sure-fire favourite with all owners of 1·- 1·5 c.c. engines.

We have been asked by the distributors of the **Manning Care** Relay to point out the price of the standard relay, which is wound to 7,000 ohms resistance, is 36s. 6d., and that there is an additional charge of 2s. for winding relays to values other than this figure. In addition, there is also a waiting period of approximately four weeks for specially wound versions.

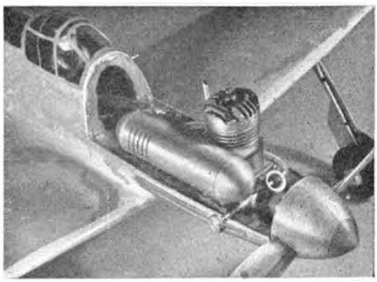
Keil Kraft transfer sheets for their scale range also suits 1/48th solid bombers, price 9d. per sheet

Know Your Engine

PART NINE SILENCERS



Effective silencers used by Ron Moulton on his Fox 35, left, and Enya 19 at right, reduce noise level to that of a 'Sec. diesel. Outlet pipe of the Fox silencer is ¼" diameter, at end of 1" empty alloy tube. 11" long. Has no effect on power, gives very consistent power run.

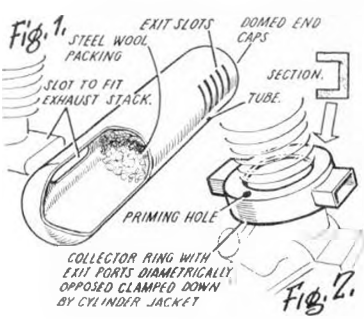


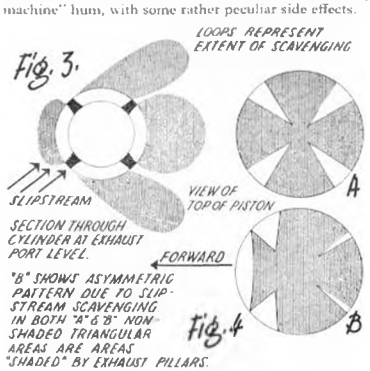
THE MODEL ENGINE is a remarkably noisy piece of machinery—a feature which cuts both ways. Noise implies power and so, to a large extent, the noisier and faster an engine the more potent it appears, and the greater its sales appeal. But to the outsider the nuisance value of a model engine being operated anywhere in his vicinity is considerable. It was noise more than the danger element which brought down drastic restrictions on the flying of power models in public parks—and, in fact, continues to get model flying banned in many areas. Even the test running of an engine in an average house or garage is apt to upset dozens of neighbours and although this problem has been with us for a number of years, very little attempt even has been made to find any sort of solution.

The apparent (complete) answer is an efficient silencer. Periodically one hears engine manufacturers condemned for not having thought to produce a fully-silenced engine for "urban", as opposed to "country" flying, but seldom have the critics given much thought to the implications involved. There have been commercial silencers produced for model engines (the American Mart-Lee unit appeared some ten years ago), and individual manufacturers do supply silencer adaptations for their engines (Davies-Charlton and E.D., for example). But the silenced engine applied to a model aeroplane remains a complete rarity.

The original Mart-Lee silencer consisted of an aluminium tube of roughly one inch diameter, blanked off at each end. A port was cut near one end of the tube to fit closely the exhaust stack of the engine and the other end of the tube cut with a number of slots for escape of the exhaust gases. This end of the tube was stuffed with steel wool—*Fig.* 1. One purchased the silencer as a complete unit, filed the slot to match the exhaust stack and held the contraption in place with a length of spring rod passed round the cylinder.

As an attempt to produce a simple commercial unit the Mart-Lee silencer had many points in its favour. Provided the fit on the engine stack was reasonably close silencing was quite effective on the engines then current. It reduced the crackle of an Ohlsson to a "sewing machine" hum, with some rather peculiar side effects.





Silencing as such was quite effective, but even so the size of a unit required for the low-speed spark ignition motors of that period was quite considerable. A 5 c.c. motor needed a tube at least 5 inches long; a 10 c.c. motor a 10-inch silencer length. A big problem is that in sealing off the exhaust ports in this manner, direct priming through the ports to assist starting is ruled out.

High Frequency Notes

The problem of silencing is not so much a question of reducing the noise level as one of filtering out and absorbing the objectionable high frequency notes. Size for size, the two-stroke engine is far the noisiest of the reciprocating internal combustion engines. For the same speed it has twice the explosion frequency of a four-stroke, and also a lower brake mean effective pressure. That means that the exhaust is open with the gases at a higher pressure, hence the more violent their escape of the gases, not the actual explosion or firing cycles.

The actual exhaust note varies considerably with different engines, and even with the same engine under different operating conditions. The "crackle" associated with high-performance engines is a welcome feature from the sales appeal angle and full size car and motor cycle manufacturers may go to considerable pains to achieve it (*e.g.*, in fitting exhausts of "resonant" length, although of course another reason for this is to improve cylinder scavenging).

Collector banjo for 360° exhausts

Where an engine has an exhaust stack, *fitting* of a silencer is a relatively straightforward problem. In the case of circumferentially-ported engines a collector "banjo" is required, as sketched in *Fig.* 2. The groove should approximate to the depth of the port opening and the exit ports cut in the walls (for connection to the silencer) should be as large as possible. Preferably, there should be two such ports diametrically opposed.

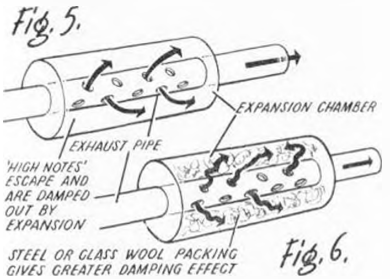
The fitting of such a banjo may affect the performance of the engine. If the design relies on sub-piston induction of air, this will no longer be effected. In fact, the engine will suck back exhaust gases instead of air (when the silencer is attached).

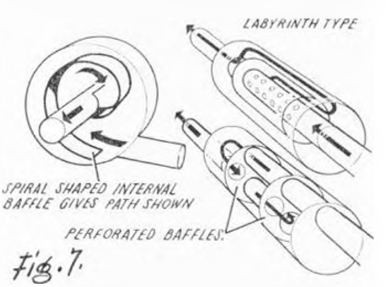
Another way in which running characteristics may be affected is that slipstream scavenging is now eliminated. With "open" porting, the slipstream playing back around the cylinder may materially improve scavenging. —*Fig.* 3. On some engines the effect of removing such scavenging effect may be quite noticeable, on others negligible.

Incidentally, a fair idea of the normal "escape path" for the exhaust gases can be had by examining the top of a piston on a new engine after some twenty minutes running. Areas subjected to gas flow will be carboned up far more than "shaded" areas. A symmetrical pattern (with the light triangular patches indicating the "shading" effect of the exhaustpillars) as in 4(*a*) would indicate that there is no effective slipstream scavenging. A strong asymmetric pattern could mean strong slipstream effect.—*Fig.* 4(*b*).

As to the silencer units themselves, a "packed" silencer tube will provide most effective silencing, but the higher the operating speed of the engine the greater the adverse effect on performance through back pressure. The most satisfactory type of silencer is undoubtedly the straight-through layout with a surrounding expansion chamber. The length of pipe inside the expansion chamber is perforated, the expansion chamber itself being just a hollow cylinder.—*Fig.* 5—or a cylinder packed with steel or glass wool.

A straight-through silencer offers virtually no resistance to the passage of the exhaust gases (other than friction of the walls of the pipe) and by opening the flow radially into an expansion chamber, most of the objectionable high notes will be filtered off. In other words, a straight-through exhaust will only remove the high notes, whereas the packed silencer of *Fig.* 1 will remove both high and low notes. The effect of packing in the expansion chamber of a straight-through silencer is to rapidly dampen the "high" notes rather than relying entirely on "expansive" damping and so should result in a lower overall noise level than the type of *Fig.* 5. The unpacked expansion chamber can, however, be quite effective if large enough.





The final note of such an exhaust (whichever type is used) will be affected by the total length of exhaust pipe. With a resonant length of pipe the final note can be quite loud (although not necessarily "objectionable" since it will be lacking the high notes). But it must be remembered that resonant effect will be achieved at only one speed. Thus if the normal operating speed corresponds to a resonant length of pipe, altering the length of pipe will cut down the overall exhaust note. Conversely, with a non-resonant length at operating speed, the exhaust may resonate at some lower or higher speed. Resonant length will also correspond to most efficient cylinder scavenging. (*Continued overleaf*)

Mart-Lee Silencer dwarfs an Ohlsson 29; reduces exhaust note to "Bambi" level, revealing piston slap and big end knocking

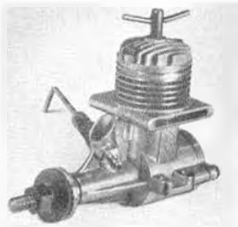
Silencers *(continued)*

The size of expansion chamber required for effective silencing is quite alarming, from an aeromodelling point of view. On power boat installations, where silencers are obligatory, a 5 c.c. engine commonly has twin exhausts and twin silencers, each with an expansion chamber some 1¼ to 1½ in. diameter and 7 in. long, *i.e.*, a total expansion chamber of some 250 to 300 c.c.—more than 50 times the internal displacement of the engine! It is, therefore, difficult to think of an effective silencer for existing modern control line or free flight models fitted with an engine of more than 1·5 c.c. where the silencer would not be either too heavy or too large to accommodate on the model. A possible solution would be to design the fuselage around a silencer of the required size.

On small diesels of up to 1 c.c. or possibly slightly larger, a reasonable degree of silencing can be produced by fitting a collector ring and attaching a fairly long length of neoprene tubing for the "pipe". A length of at least 6 to 8 inches is usually required and the tubing diameter must be at least ⅜ in. bore, preferably slightly larger. Some power loss will result but the noise level can be reduced substantially. Such an exhaust system is, necessarily, limited to short engine runs—a maximum of about 30 seconds—otherwise the tubing will melt. Also it cannot be used on glow motors.

Thus it would appear that the main application of silencers to model aero-engines is restricted to bench running and here, we feel, they could be put to considerable use. Apart from the reduction in noise level, by *collecting* the exhaust objectionable oil waste need not be spattered all over the place and the exhaust fumes themselves can be led *out* of the test room (*e.g.*, through a window) by extending the length of tailpipe used. Some further suggested designs which should prove effective are sketched in *Fig.* 7.

For marine work, the arge brass E.D. exhaust expansion chambers effectively take care of exhaust sludge and reduce noise level without affecting performance



Left, the Frog 80 will replace the "50", having identical bearer holes, runs particularly well inverted. At right: the new Webra range from Germany showing diesel and glo Mach 1's compared, the new 1.6 c.c. Sport Glo and the .8 c.c. Piccolo Glo. At present, these are not available in Great Britain

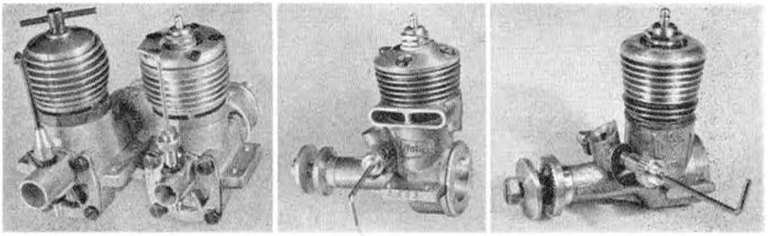
Motor Mart

WITH NINE NEW engines illustrated on these pages and several more under the avowed secrecy of our editorial bonnets, 1957 looks like being the year for a bumper crop in the miniature two-stroke world. We've been running up our **Fox 29R** (Know Your Engine heading last month) and this is one motor that can take as much fuel as a bulbous pen bladder can blast through the jet. For a plain-bearing motor its output is simply tremendous, and we venture to suggest that the system of using negligible crankcase pressure and a pressurised fuel feed will spread to other engines in the racing classes. A test on this engine will be included in an early issue.

Another new American glow engine that is fast gaining a reputation for high output is the **K & B 099**, a 1·6 c.c. powerplant that the Bradford modellers have been flying in winter months ready for the year's contests. On an 8 x 3½ it is said to turn out 14,000 revs—not far short of the well-established K & B "15".

On the Continent one cannot escape the flush of interest in the **Barbini B.40**, top commercial engine in the World Speed Championships, and a brother to the Barbini **B.38** ·99 c.c. diesel, illustrated below right. This red head is a robust product of the very much alive Italian model industry, and is well up to the performance expected of the modern 1 c.c rotary valve unit. Then there is another fine Spanish motor from Fernando Batllo at Barcelona, known as the **Byra 1·5** which is right in the top competition class by virtue of its disc valve induction and twin ball races. It arrived set up to run clockwise—we found that out after a half-hour of frustration! More on this later. Still across the channel, **Webra** of Berlin are planning a glowplug series as illustrated above right. The 2·5 **Mach 1 Glo** is basically similar to the conversions of the popular diesel, seen at speed meetings, except that it has a *smaller*, shorter

At left: the Byra 1.5 with twin ball races and rear disc valve arranged for clockwise running. Right: the Barbini B.38 1 c.c. diesel and the latest Ulban engines. Centre is the Mark 2 version of the 1 c.c Spitfire and extreme right, the Rapier, a big 2.5 with down draught carb and disc valve



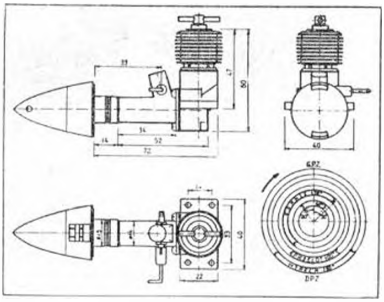
induction throat, and a spray bar assembly instead of a split needle unit. The 1·6 c.c. **Sport Glo** is an entirely new motor and a complete diversion from the usual Webra design of 360-degree porting, while the ·8 c.c. **Piccolo Glo** is again a new version of the established diesel. All three should find a good following in the U.S.A.

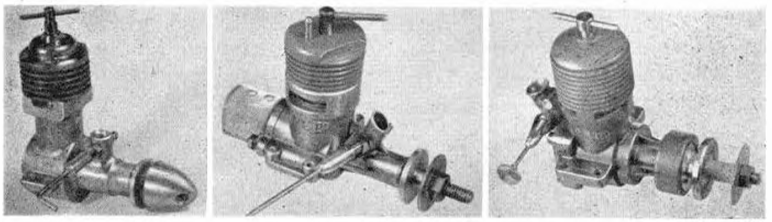
Lest it be thought that British manufacturers are lagging behind, we hasten to approve three fine new engines announced this month. **Davies Charlton** have a Mark II **Spitfire** 1 c.c. diesel with a Sabre-like crankcase and integral tank in plastic. New assembly methods for this very popular easy-starting 1 c.c. motor should endow it even more to the hearts of the sports modellers, and it falls happily into the same family appearance of the Merlin, Sabre series. Perhaps the biggest news is that D-C are now in full scale production with a hot contest motor in the International 2·5 class. Christened the **Rapier,** it features twin ball races, downdraught carburettion for the disc valve, stout bearers, 360-degree porting, a lightened prop driving washer that leaves the shaft free for a small prop hule, and, above all, a performance equal to the demands of all contest flyers. We know this engine has been under the development wraps for more than a year, and the outcome is something found to be best out of dozens of experimental designs. Both these new D-C engines are distinguished by their green anodised cylinder heads.

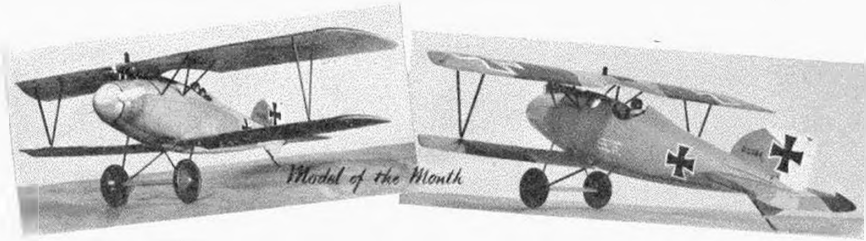
International Model Aircraft have produced the third new British motor, the **Frog 80,** a ·8 c.c. diesel of pleasing appearance, rotary valve induction and very shallow exhaust ports, which have generous stacks. In external stature, the 80 is compact, and for cowling it can be neatly mounted so that the stacks carry all exhaust cleanly out of the airframe. This should make it very popular with the scale fans. Full analysis appears next month.

New Polish diesel (below) is this 2.43 c.c. long shaft design, reproduced complete with timing diagram for the benefit of home-builders

In a Polish magazine, Josef Sladky disclosed the porting and transfer detail of his fast SK25-1955 World Speed Championship holder







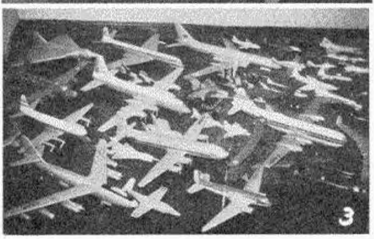
Model News

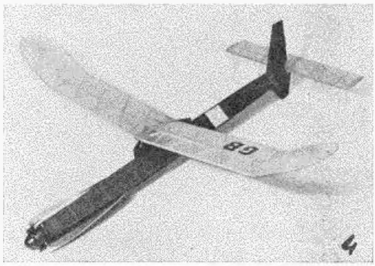
AT THE RISK of repeating ourselves, our choice of "Model of the Month" is none other than Doug. McHard's beautiful 1/8th scale Albatros D.V presented in plan form in our last issue. We make no apologies for facing you with photographs of this model once more for without doubt it is one of the finest free flight scale models we have seen for many seasons and deserves all the publicity it can get. For those who did not see the plan last month, it is FSP.646 price 7s. 6d. through Aeromodeller Plans Service.

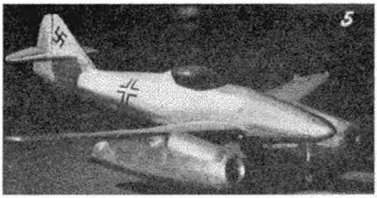
Picture **1** was taken at the Irish Team Race Championships where Tony Morelli and Niki Rice, Drimnagh Aeromodellers, won both Class A and B events at Baldonnel Aerodrome. Here they are posing with the Oliver-powered Class A winner and by the appearance of the background it seems that the final was concluded well after sunset.

Recent publication of a large group of solid scale models has brought forth spate of similar pictures from all over the country. Picture **2** shows fifteen-year-old David Ling of the Mitcham A.T.C. Squadron with part of his collection of 60 different models. Below in picture **3** is another group by Alan Turner of Stockport who adheres to 1/48th scale and has a collection of 100 models some of which are of very recent types, as this picture reveals. Mr. Turner uses A.P.S. Plans exclusively for the majority of his models and prepares his own drawings from published information of the latest aircraft, such as the Lockheed Starfighter.

Now for something that really is news! John O'Donnell has made a *new* Wakefield and we see it in picture **4** with its freshly nylon-covered fuselage and streamlined nose. As John has labelled this one "Transient", we can only presume that he has made it to cater for the latest rule changes.







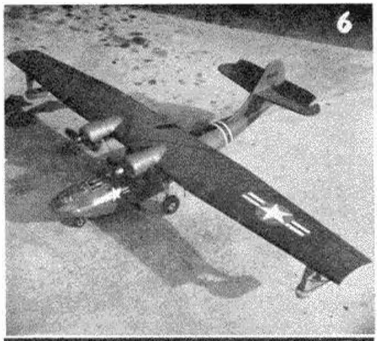
Picture **5** is the first example we have seen of a control line Jetex model. This Me.262 has not yet been flown under power and, of course, the twin Jetmasters will not give a very long power run but the result is pleasing and opens up new possibilities for this form of propulsion.

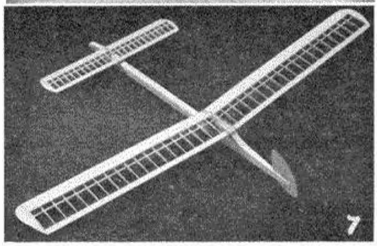
The very nice Catalina in picture **6** was made by W. V. Symes when living at Kuala Lumpur in Malaya. Mr. Symes is now back in his home town at Exmouth and told us that he had the misfortune to have the "down" line break during an early test flight. Needless to say this called for a major modification to the nose which has now been rebuilt and the Catalina is airborne once more and lands safely every time, no matter which of the two engines stops first.

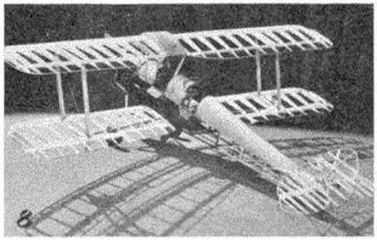
The 60-inch span Canard A/2 seen in picture **7** was made by cartoonist E. Clutton of Stoke-on-Trent and he tells us that it has now passed the initial flying tests, going up on the line like a rocket in typical Canard fashion. All up weight of the airframe was only 11¼ oz. so the model calls for extra ballast at the C.G. position which will be somewhere between the wing and tail. This is one disadvantage of the Canard layout, in that one does not have maximum fuselage cross-section where it is needed to take ballast.

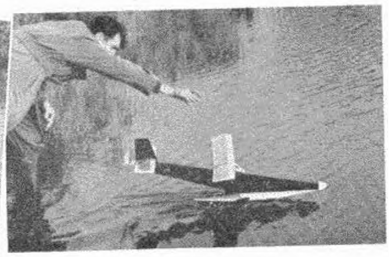
Another framework photo is that of the 1/12th scale Tiger Moth **8** inspired by the E. J. Riding feature—February, 1942, AEROMODELLER. R. F. Winfrey has reproduced every detail of the full size Tiger Moth in this non-flying model, including the engine, and we understand that it has been built intermittently over the past 14 years!

Now for a refreshing change in the Flying Boat sphere. Five members of the Epsom and District M.F.C. went to Earlswood Lakes near Redhill on November 4th hoping to crack the British Rubber-Powered Flying Boat Record but unfortunately a few trees got in the way. As photo **9** shows, they are striking along entirely new lines with the "Tinkerboat": a Canard Wakefield-size model with rubber motor angled to give considerable upthrust, and a very novel wing and tail arrangement. We wish them success in future attempts and hope they break the figure which at the moment stands at 1 : 05.





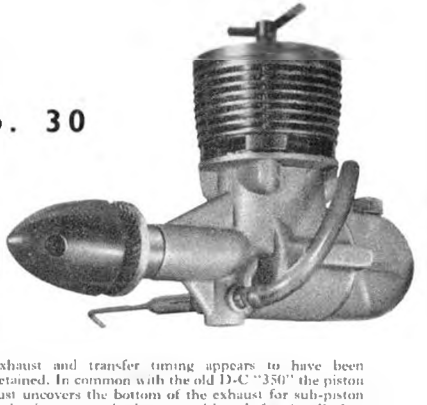




Engine Analysis No. 30

Davies-Charlton

MANXMAN



reviewed by R. H. Warring

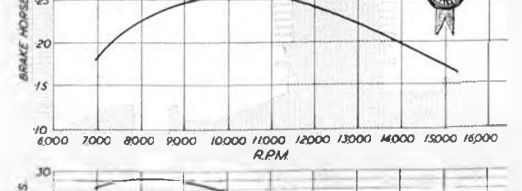
IMMEDIATE IMPRESSION on opening the box was—what a nicely-made, attractive engine. After a total of some three hours running time we can only endorse that its performance is well up to the standard promised by its initial appearance.

Essentially the new "Manxman" is similar to the original D-C "350", with the same bore and stroke and similar overall appearance. The most striking external difference is that the cylinder finning is now incorporated on a separate jacket and anodised bright red. On the old model the crankcase casting was extended to the top of the cylinder with cast-in fins and a separate head. On the "Manxman" the crankcase casting terminates in a flange at exhaust port level with a cylinder jacket locking the steel cylinder proper in place by means of four screws through the head (integral with the jacket), terminating in four lugs cast into the new crankcase unit. Another difference in the crankcase casting is a slight increase in metal thickness at the front end, which was the weakest point on the old model.

With the bore and stroke substantially unaltered (the bore is actually slightly down on the old model), similar exhaust and transfer timing appears to have been retained. In common with the old D-C "350" the piston just uncovers the bottom of the exhaust for sub-piston induction at top dead centre, although fractionally less than before. The induction entry porting is slightly larger, *i.e.*, the hole in the crankshaft is about $\frac{1}{8}$ in. up and the timing slightly modified to give approximately 15 degrees more overlap.

Despite the very substantial steel cylinder assembly it is possible to produce distortion and subsequent binding by tightening down the hold-down screws too much. The cylinder itself is not located circumferentially and so, if dismantled, may result in a slight loss in performance when reassembled, if not exactly the same way round as originally. It is therefore an engine which should not be taken to pieces unnecessarily. Also we found that for minimum friction it paid to have the head hold-down screws a little on the slack side, rather than too tight. Even in this state they have no tendency to work loose at the speeds at which the engine will most usually be run.

Essentially the "Manxman" is an engine for moderate



SPECIFICATION

Bore: ·680 in.
Stroke: ·5625 in.
Displacement: 3·444 c.c. (·21 cu. in.)
Bore/Stroke ratio: 1·17
Bare weight: 6¼ ounces (including tank)
Max. B.H.P. ·257 at 10,700 r.p.m.
Max. torque: 28·2 ounce-inches at 8,250 r.p.m.
Power rating: ·075 B.H.P. per c.c.
Power/Weight ratio: ·0395 B.H.P. per ounce

Material specification:

Crankcase: Light alloy die casting
Cylinder: Hardened steel
Cylinder jacket: Alumn. (anodised red)
Piston: Mechanite
Contra-piston: Mechanite
Connecting rod: Aluminium alloy
Crankshaft: Nirkel chrome alloy steel
Crankshaft bearing: Plain
Spinner nut: Dural (anodised red)

Manufacturers:

Davies Charlton Limited,
Hills Meadows,
Douglas, Isle of Man

Retail Price:

66s. plus 14s. 11d. P.T.
Total £4 0s. 11d.

speed running. It reaches its peak power just before 11,000 r.p.m. on Mercury No. 8 fuel and whilst possibly higher speed running might be improved by a little experimentation with fuel mixtures it is definitely "sweetest" running within the speed range of 10,000-11,000 r.p.m. Below 10,000 r.p.m. it becomes rather less happy about holding consistent r.p.m. and at the very high speeds it becomes more and more critical on compression and needle valve setting for best performance. Vibration also tends to build up as the speed passes 12,000 r.p.m. Starting characteristics similarly deteriorate beyond about 13,000 r.p.m. That is to say, whilst the engine is still easy enough to start (using a rich mixture or generous prime and compression slackened well off), it has a pretty vicious "snap" on a 7-inch diameter propeller.

One rather interesting characteristic was that it was not possible to stop the engine by slackening the compression off to its limit. All this did was to cause the engine to slow down, but even backing the compression off as far as it would go, the "Manxman" still kept on running. This characteristic was maintained right through the speed range. The fuel supply has to be shut off or the needle valve turned down to stop it.

Strangely enough the actual compression setting required for optimum performance with any propeller load was fairly critical. The higher the speed the more critical the setting became. Similarly with the needle valve, it also being necessary to progressively richen the mixture (*i.e.*, open up the needle valve more and more) as the speed went up. The engine *runs* quite well with almost any propeller load, except the smaller sizes, over a range of settings, but there is a definite combination of adjustments which gives the very best with any particular propeller. Two propeller sizes, incidentally, which we found the "Manxman" did not like on our tests were the 8 x 8 and 8 x 9 Team Racer props. This may have been a characteristic of the individual propellers used.

General handling characteristics of the "Manxman" are excellent. It is a noisy, powerful engine, but starts readily with either finger choking or a prime through the exhaust and the compression turned back slightly. Provided the mixture is not excessively weak the engine will start and run continuously within a couple of flicks, with ample time to make final adjustments to the settings. The compression control is still without being difficult and can be grasped without fear of burning the fingers. The needle valve assembly is quite a sensibly-sized unit with a long thimble, split to provide locking action. With the choke tube pointing vertically downwards the needle valve position is immediately in front of the right engine bearer, in a practical installation, which means cutting the bearer off quite short. It does have the advantage, however, of bringing the needle valve well back from the propeller disc.

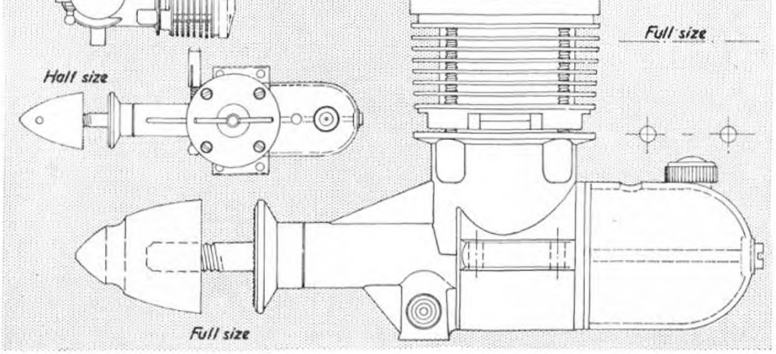
The brake horse power curve is quite flat so that there is not a great deal of difference in power output over a range of from 9,000 to 12,000 r.p.m. There is no specific advantage in running the engine fast, in fact rather the reverse is true. Hence our personal preference would be for propeller sizes giving a static r.p.m. of around 10,000. For sports flying and/or radio control work, a static r.p.m. of 9,000 would probably be better, equivalent to something like a 11 x 4 or 10 x 5 propeller.

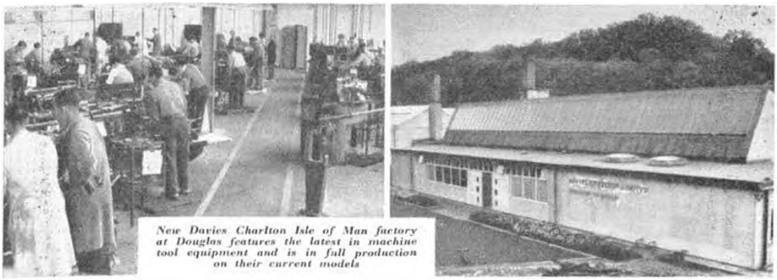
All Stant wooden propellers. Mercury No. 8 fuel.

Performance essentially similar on Allbon Diesel fuel and Mercury RD.

PROPELLER—R.P.M. FIGURES

Propeller dia. x pitch		*r.p.m.*
11 x 5		8,000
10 x 6		8,200
9 x 8		8,600
10 x 4		10,400
9 x 5		10,500
9 x 4		11,000
8 x 6		11,200
8 x 8		10,000
8 x 5		12,250
8 x 4		13,000
7 x 6		13,300
7 x 5		14,000
8 x 9	(TR)	9,600
8 x 8	(TR)	10,900
7 x 9	(TR)	11,000





New Davies Charlton Isle of Man factory at Douglas features the latest in machine tool equipment and is in full production on their current models

The 8 x 9 (narrow blade) propeller would appear to be the logical choice for a team racer installation, except for the running feature mentioned before.

Running the "Manxman" on smaller propellers, *i.e.*, at higher speeds, merely makes it harder on the fingers for starting, increases the vibration and does not give any more power. In fact, beyond 12,000 r.p.m. power output begins to fall off quite rapidly. Carried to extremes we found that on a 6 x 4 propeller the "Manxman" gave a lower r.p.m. figure than a good 2·5 c.c. engine, became extremely critical on adjustment and tended to vibrate badly. But since this was some fifty per cent. past its peak power point, such characteristics were hardly surprising. We mention this to emphasise that the "Manxman" will give its best performance at somewhat lower speeds than most people are used to these days, within which range, of course, it is appreciably more powerful than the best of the two-and-a-half's. Operated within this range it becomes a most docile engine for its size.

The new "Manxman" is deserving of a lot of praise as a well-designed, extremely well-made and finished engine with a good performance. It has no particular vices that we could discover and, frankly, about the only thing we could criticise would be the overall weight. Six and a half ounces is rather on the high side, but for it you get a robust engine. We particularly welcome the integral clear plastic tank as a standard fitment and the pleasing overall appearance, both of which must undoubtedly add to its "eye appeal". Having tried it out pretty thoroughly we can only confirm that its performance and general handling characteristics come up to the expectations present on first taking it out of the box. But we do think it worth a new instruction leaflet rather than one appropriate to the older D-C "350".

What's the answer?

ROUND THE POLE FLYING

Our club has taken up round-the-pole flying for the winter and we are running regular weekly contests both for duration and speed. But both types run into the same trouble. At the start of a flight with a fully wound motor the model climbs on one side of the circle and dives on the other, more often than not touching down and ending the flight. We get away with this on the duration models by letting the prop run for ten seconds before launching, but we cannot very well apply this technique to the speed jobs. What's the answer?

What would YOU do in a case like this! Think a moment then twist this page for the solution to the problem printed below.

ANSWER. The best model on a R.T.P. model is the point of attachment of the line. If attached to the wing tip, climbing and diving trouble is quite common. It is usually possible to cure this by moving the line attachment inwards along the trailing edge. Try experimenting to find the best position. Climbing and diving. Also the wrong c.g. position can make full power difficult to control. Most R.T.P. models perform best with the c.g. at 30 per cent. chord and that applies equally well to duration or speed.

At right:
"Duration"

At left:
"Speed"

Readers' Letters

PERTINENT POINTS FROM OUR DAILY CORRESPONDENCE

Last Words on Radlett

DEAR SIR,

Having just received my Christmas copy of the AEROMODELLER, which as usual I thoroughly enjoyed, I feel that a reply is necessary to Capt. Milani's letter on page 676. The Captain, whom I met at Radlett, has a good case, but has to my mind presented it badly. All his criticisms are based on Control Line entries and therefore his suggestions become very unfair to Free Flight modellers, if carried out fully. I agree that the 30 sec. qualifying rule should be adhered to, but "after flight" inspections would greatly penalise any f/f model which after a reasonable flight landed in a tree, or hit a car, as mine did. The answer, I feel, is to suggest that the St. Albans organisers use the R.A.F.-M.A.A. system of different classes in the Concours contests for c/l and f/f models (both with 30 sec. qualifying flights) and a separate contest to determine the full flying qualities of scale models. Lumped together as they are at the present Radlett contests, the f/f modeller in a mixed contest is automatically penalised in the finish ultimately due to weight considerations when considering materials usable such as metal cowlings, wallpaper covering, and innumerable coats of dope on c/l model. I also feel that to qualify a Free Flight model in a high wind requires much greater skill than to fly a 10-lb. model in a circle on control line cables for the same period of time. The point that multi-engined models fail to fly properly when all four are not running is a little unfair, as their full-sized counterparts have a similar tendency if not properly handled and, therefore, as long as the model flies for 30 sec. even erratically it should qualify. Finally, I agree that *no* model should be re-entered in any contest in which it has already been "placed".

My congratulations to the organisers of Radlett for a fine day's aeromodelling and may the weather be fine for them in the future. I think that Capt. Milani will agree with me, that if there were no criticisms of either models, results, or organisers, half the fun would be lost at any meeting.

As a point of interest, Mr. Editor, you may like to know that my winning entry in the above criticised contest has now been airborne in the following countries: England, Africa, Iraq, India, Ceylon, Malaya, Borneo, Australia, Fiji, Hawaii, and Christmas Island. Could this be a record I wonder? Total mileage covered in box and out some 16,000 miles (mostly in).

F/O E. H. Norman.

Christmas Island, Pacific

DEAR SIR,

I also was an entrant in the "Concours of Elegance" at Radlett and on the whole I agree with Capt. Milani. There are, however, one or two points I should like to make.

That there should be a time limit of say three minutes in which to start engines, with three minutes per engine for multi-types. I noticed that the crowd were completely fed up waiting to see these models fly. My position in this event was last, but I *did* fly (remember the large white stunt model—*photo centre*, Ed). So you can imagine it caused me no small annoyance watching the puny efforts of so-called experts of our art trying to start their engines.

We want to see practical flying models in the "Concours" not glorified dust collectors which with luck might fly one day. Capt. Milani does not suffer in this respect. When these masterpieces did eventually get into the air their performance left much to be desired.

It should be a rule that the model should be flown exactly as it was judged in the "Concours" enclosure, *i.e.*, only the lines to be attached and the tanks filled. No prop change to be allowed, etc.

S. Robinson.

Hextable.

Mr. S. Robinson's attractive all-white stunt model (see above)

The Richthofen Story

DEAR WHITEHOUSE,

I was very interested in your article in the AEROMODELLER. I was in No. 20 Squadron at St. Marie Capelle and met the Red Knight on July 17th, 1917.

I was piloting an FE2D and he came across my bows so close that I could see his face clearly. He was diving on an RE.8 and from a recent broadcast on Early Flying Days I imagine that it was the actual one in which Bradford was flying—Bradford was, I think, the broadcaster.

I quite agree with your views and in fact could add to them. I suppose it was necessary to boost morale and encourage recruitment of volunteers, but the amazing totals did not add up. In fact when the full total of "confirmed" was made known No. 20 Squadron had the highest total, but I do not recall anyone outstanding. We had, of course, our V.C., but nothing was told to equal—say the exploits of Bishop who was reported as having "downed" 6 E.A. on a lone flight before breakfast!

I recall that on occasions aircraft from No. 22 Squadron and No. 11 used to call in for breakfast at St. Marie Capelle.

With kind regards and best wishes.

R. M. Trevethan.

Falmouth.

DEAR SIR,

Whilst I must congratulate you on the Christmas AEROMODELLER, I feel that I must point out one or two mis-statements.

In the articles by Arch Whitehouse, which is a most interesting one, he says that Richthofen left the flying schools after Boelke's death. Actually he was a member of Boelke's original staffel having been asked to join by Boelke while on a visit to the Russian front. He formed his own squadron early in 1917 as did most of the other surviving members of Staffel 2.

It was not till April, 1917, that the great Richthofen publicity campaign started. Apart from the above remarks, I agree with Mr. Whitehouse.

Now to Mr. Grey's article on the FE.2B. He says that early F.E.'s had Lewis guns with water jackets. I'm afraid he is wrong: the Lewis guns used were of the infantry pattern and were air cooled, the only difference being that a spade grip was used instead of a rifle type butt. Later the part of the cooling jacket forward of the gas cylinder (which on the infantry gun formed a flash eliminator) was removed to lighten the gun. This was the type mostly used in the R.F.C. for all purposes. The fully stripped Lewis was not in common use until later on the war after some modification.

Squadrons 38, 58, 83, 100, 101, 148 were all night-bombing units. They were painted all black and carried the standard night-bombing markings, consisting of a white circle with a black centre and only the Serial No. on the rudder.

The bombs carried consisted of 25, 65, 112 lb. H.E. and 40 lb. incendiary; these were carried under the wings; sometimes 230 lb. H.E. bombs were carried under the fuselage. Two machines of 100 Squadron had the front cockpit modified and carried a 1½-lb. shell gun, this was used for ground attack at night.

I notice that Mr. Cox has painted the guns on his Albatros DIII plain black; I find that painting spandau guns dull silver overall and then marking the slots in black gives them a much better appearance.

M. Parrott.

Little Brickhill, Bucks.

(Contributor Peter Gray would like to see written authority for the statement that night flying F.E.s were painted black, etc., and apologises for perpetuating the incorrect misnomer by referring to the Lewis radiator casing as a water-jacket.—ED.)

DEAR SIR,

I would like to say that I view any full-size item in the AEROMODELLER with grave suspicion as I would hate to see it turned into another "R . . . R . . . " type monthly. However, that Richthofen yarn was worth seeing and a little "Flying Aces" type of material would go down well from time to time.

M. J. Dumble.

Surbiton, Surrey.

DEAR SIR,

I must congratulate you on your Christmas issue of AEROMODELLER, but I must point out an error where Arch Whitehouse refers to "six British Sopwith 'Camels' in hot pursuit". This cannot have been true for the incident described by Mr. Whitehouse took place on April 13th, 1917, and the first "Camel" Squadron did not reach the Western Front until July 24th, 1917. Obviously, Mr. Whitehouse mistook a flight of "Pups" for the "Camels" when looking back over such a long period of time.

C. Pengelly.

Weybridge.

DEAR SIR,

In your December issue of the AERO-MODELLER you invite comment on the story by Arch Whitehouse.

For me it certainly brought back memories of the pre-war "Flying Aces" (I still have a few copies) and for myself, I think it would be wonderful to make it a regular feature.

J. V. Punter.

Bristol.

Services Rendered

DEAR SIR,

May I thank you for the service of your Classified Advertisement column. I have today received an excellent offer for the engines advertised in the January issue of AEROMODELLER. I do not think a swifter transaction can be on record, the offer arriving on the day of publication of the magazine.

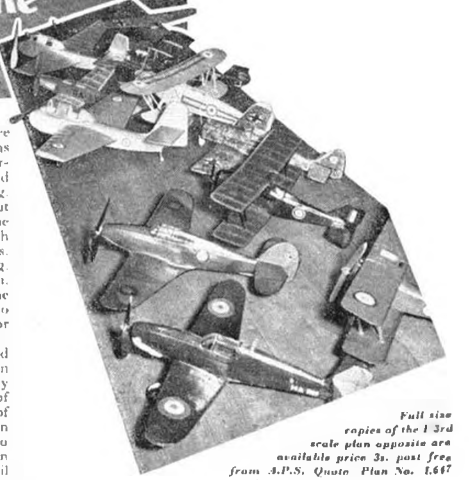
J. S. E. Pearson.

Kingston-on-Thames.

(We have a saying at AIM—if it won't sell in classifieds it won't sell at all.—ED.)

Flying in the Clubroom

Have fun at your Club meetings with Round-the-Pole flying. Speed, duration, scale or Team racing—it's all possible in a room approximately 13′ wide.



Full size copies of the 1/3rd scale plan opposite are available price 3s. post free from A.P.S. Quote Plan No. 1,647 when placing your order.

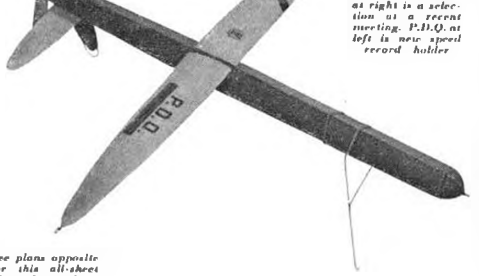
CLUB SECRETARIES frequently write plaintive appeals to the Editor in request for suggestions on Club winter activities, and it is quite surprising how few of these groups consider the old standby—R.T.P. or round the pole flying. All you need is floorspace, measuring about 12 ft. square at a minimum (13 ft. allows some wall clearance!) a sturdy centre pylon with a free-moving pivot for the line, and . . . models. What can be done in this space is amazing. The Class A duration record stands at 7 min. 27 sec., by Phil Read of Birmingham, and the speed figure is now 45·1 m.p.h., thanks to Dick Taylor and the pusher PDQ, plans for which appear opposite. Why not have a try?

In the West Country, Gloucester and Cheltenham clubs fly scale models as seen in the above pictures, and it does not tax the grey matter too much to see that the majority of these models can be made from the profusion of suitable scale model kits. Here, the model can be judged for performance *and* appearance, so the man who cannot quite make the grade on duration, can score in providing extra detail and a fine finish.

Dick Taylor's PDQ is a model guaranteed to shatter the nerves of any unsuspecting spectator. It is a pusher for two reasons. A, because the airflow over the model is smooth and unaffected by slipstream, and B, because the prop is naturally protected in its rear position! Large fins offset the nose area, and complete with 12 strands of 1/4 x 1/24th rubber, 27 in. long, it weighs 4¼ oz. With a 16-strand motor it has actually covered five laps at 67 m.p.h.; but the S.M.A.E. rules call for a ten lap run, and the motor just does not last that long! Construction is extremely simple, as will be seen by the plan, so why not try to beat Dick's speed figure?

S.M.A.E. rules are:—

Pole 18 in. high; 6 in. arm for line attachment. Radius to C.L. of model 6 ft., diameter of circle 12 ft. One lap for take off then 10 laps timed. Model span minimum of 60% of length overall. Maximum weight 8 oz., maximum wing loading 20 oz. per sq. ft. area of wing.



Gloucester and Cheltenham Clubs have indoor scale meetings. Above is Stan Perry's Hawker Fury airborne, at right is a selection at a recent meeting. P.D.Q. at left is new speed record holder

See plans opposite for this all-sheet 45 m.p.h. speedster

BRITISH RECORD HOLDING R.T.P. RUBBER SPEED MODEL

P. D. Q.

DESIGNED BY

R.L.S. Taylor

THE AEROMODELLER PLANS SERVICE

38 CLARENDON RD., WATFORD, HERTS

3/-

MATERIALS REQUIRED	
2 SHEETS OF 3/32"x3"x36"	SCRAP 1/32" SHEET 6 1/8"x1/4"
1 SHEET OF 1/16"x3 3/4"x24"	6" OF 16 S.W.G. PIANO WIRE
1 " " 3/16"x3"x24"	18" " 20 " "
4 7/8"x1/8"x3/4" OBECHI	6" " 24 " "
3" x 1/4"x 1 1/4" BALSA BLOCK	1 16 S.W.G. BUSH
1 THRUST RACE	

POWER : 12 STRANDS OF 1/4" x 1/24" RUBBER : 27" LONG MAX TURNS APPROX 400

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

RUBBER BANDS TO SECURE U/C

CELLULOID REINFORCEMENT

CEMENT WING IN PLACE AT + 2½° INCIDENCE

CEMENT TAILPLANE AT −1°

20 S.W.G. WIRE HOOK

C/L WIRE BRACE

VALVE RUBBER

16 S.W.G. WIRE 'S' HOOKS EACH END

16 S.W.G. WIRE NOSE HOOK

NOSE BLOCK

20 S.W.G. BRACKET BOUND & SOLDERED TO LEGS

20 S.W.G. WIRE U/C LEGS

BIND & SOLDER

24 S.W.G. CROSS STRUT

SKETCH OF U/C ASSEMBLY

FUSELAGE REINFORCEMENT 4 OFF 1/32"

1/8" SHEET PLUG CEMENTED TO NOSE & TAIL BLOCKS

2 OFF

1 1/4" SQ. NOSE & TAIL BLOCKS

COVER WHOLE MODEL WITH LIGHTWEIGHT 'MODELSPAN' AND GIVE 2 COATS OF CLEAR DOPE

FINS

1/8" X 1/4"

SCRAP 1/4" SQ.

TAILPLANE

SECTION A A

WING

1/32" SHEET

SECTION B B

16 S.W.G. BUSH

THRUST RACE

16 S.W.G. PROP SHAFT

24 S.W.G. SKID

1/16" SHEET TAILPLANE

ATTACH TO 18" CENTRE POLE BY STRONG THREAD OR C/L WIRE, GIVING 6" RADIUS TO ℄ OF MODEL

TIME SPEED OVER 10 LAPS + ONE LAP FOR R.O.G.

SCRAP BLOCK

LINE OF MAX. CAMBER

20 S.W.G. WIRE HOOK FOR LINE ATTACHMENT LET INTO BOTTOM SURFACE AND COVERED WITH A SILK PATCH

3/16" SHEET WING THIN TO 3/32" AT TIPS

1/8" x 1/4"

POSITION OF REINFORCEMENT SHOWN DOTTED

1/32" SHEET

FUSELAGE SIDES 4 OFF 1/32" SHEET

1/8" x 1/4"

PUBLISHED AEROMODELLER FEBRUARY, 1957 1 647

RADIO CONTROL NOTES including

further guidance for HILL RECEIVER constructors and a Canadian MOTORISED ACTUATOR

READER A. H. MUIR has been kind enough to forward his experiences with the Hill Receiver, feeling that they may be a guide to other people. We quote Mr. Muir's letter.

"In view of the difficulties experienced by recent builders of the Hill Receiver and in the light of my own exasperating experience with this set, after checking and re-checking that all the wiring is correct and soldered properly, the writer feels that the following hints from a radio control novice should help all the enthusiasts who do not have the technical knowledge to spot the trouble experienced when the standing current cannot be brought down by adjusting the trimmer.

"The writer built two sets and in each case the standing current of 5 m/a could not be brought down the slightest fraction by any adjustment of the tuning controls. Surmising that perhaps the quench coil was not as it should be (in spite of very careful winding) another was wound with extreme care and also new diodes were used in the second set, but still the standing current remained adamant at 5 m/a. I bought six diodes, two of which were Brimars GD3 diodes (not surplus), but still no joy, neither were surplus valves bought.

"After reading Mr. Hill's remarks in the October issue of the AEROMODELLER I was convinced that two diodes were not giving sufficient bias to the second valve so I connected up an additional diode to pin 5 of second valve connecting same, black to pin 5, and red to black on second diode which retained the correct polarity making three diodes in use. Immediately I connected up the batteries with the trimmer full out and the iron dust core full in, as per instructions, the standing current dropped to ·3 of a m/a and thereafter has worked perfectly, rising when tuned to 5 m/a on signal. Doubtless the 'Sentercel' rectifier is the answer to all this diode trouble as mentioned by Mr. Hill in the October issue of the AEROMODELLER.

"The writer would stress that non-surplus valves and diodes were purchased in the first place in an effort to avoid trouble at the outset.

"Incidentally, the first set built is also functioning correctly with the addition of the third diode.

"Should the receiver fail to tune to the transmitter, remove the 6 pf condenser (C3) and retune. If now satisfactory remove a turn from both top and bottom of the coil and then reconnect the 6pf. If the dust core is still too far out remove yet another turn from both ends of the coil.

"In conclusion I must add that once the set is functioning correctly its performance is definitely outstanding, its sensitivity is such that by tuning in on my Eddystone 740 RX on the 27 mcs. band the Hill Receiver shows a rise to 5 m/a.

"Regarding relays which are the heart of all receivers, the writer has used the "Ivy" relays (three types), Siemens 73, Manning Carr P53C, P100 polarised and lastly the ED 4000 ohm polarised at 30s., which is, considering ease of adjustment, ease of fixing, and the ability to resist vibration, the best relay on the market today, irrespective of the cost. Why risk pounds worth of material and work on a doubtful relay when by paying a little extra complete reliability can be attained. The Manning Carr Relay is a beautiful piece of electrical engineering but is not as easily adjusted as the ED, due to the fact that lock nuts require to be slackened and tightened with every adjustment.

We asked Mr. Hill to comment on Mr. Muir's letter and he writes as follows:

"Dicky diodes have been responsible for almost all constructors' troubles so far as components are concerned. Mr. Muir was also a victim of this plague and is to be congratulated on his perseverance.

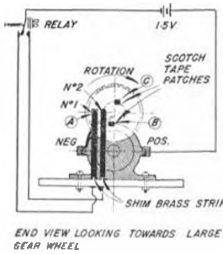
"I understand that he has now fitted the 'Sentercel' D3/2/1Y rectifiers to his receivers (*vide* October AEROMODELLER, Radio Control Notes) and wholeheartedly agrees that they are the cure for all diode troubles. Incidentally, I have found that when using this rectifier the 1·0 megohm resistor can be omitted altogether and pins 4 and 6 of V2 strapped. A further improvement in performance will be obtained if, with the Philips trimmer fully out, the valve of R.3 is reduced until the point is reached where further reduction produces an increase in the standing current. The actual value is by no means critical and in most cases a 2·2 megohm resistor across the existing 4·7 megohm will be satisfactory. With this small modification the 3V4 valves will give results comparable to that of the 3V4 valves originally specified. To return to Mr. Muir's article, whilst the removal of the 6 pf may assist in finding the correct number of turns, on no account should this capacitor be left off the completed receiver—however favourable the workbench results may seem.

"The polarised relay used will, of course, depend to a large extent on personal choice, all have their merits and demerits. The Manning Carr P.53 is essentially an industrial precision relay which is rather expensive and unfortunately has a standard coil resistance too high for radio control. As a result some constructors have had difficulty and delay in obtaining this relay wound to the lower value of 3,500 ohms specified. The E.D. polarised is without doubt excellent value for money and has been used with complete success by many constructors. The method of retaining the adjustment of the contact screws is, however, not entirely satisfactory, for after a few adjustments they become a loose fit in their supporting tabs. With only a relatively small modification by the makers to the shape of these tabs a pinch-bolt method of locking could be facilitated which would increase the safety factor out of all proportion to the very slight increase in weight. I appreciate this may push up the price a shilling or so—but as Mr. Muir so rightly points out, what is the odd shilling when so much 'folding money' in terms of aircraft and equipment are at stake!"

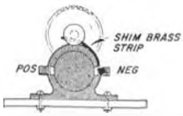
Canadian Motorised Actuator

Laurie Ellis needs no introduction to our readers, having made many friends during the past few years whilst in the R.A.F. He will be remembered particularly for his "Vultan" delta design which was further developed in enlarged form for radio control flying and showed great promise. It is our belief that deltas have many advantages for radio work and it is significant that once a radio man has seen one in the air he is a convert. However, to return to Laurie, we were going to say that he is now back in his home territory of Canada and modelling at his normal furious pace with particular emphasis on radio control. He, too, seems to have suffered escapement trouble and sends the following article describing the Ellis "Simple selective R/C Rudder Control Unit".

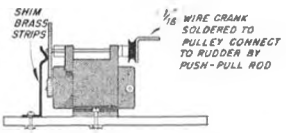
"Have you ever had trouble with a stuck escapement,



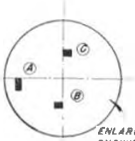
END VIEW LOOKING TOWARDS LARGE GEAR WHEEL



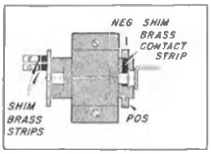
END VIEW LOOKING TOWARD PULLEY



SIDE VIEW POSITIVE TERMINAL SIDE



ENLARGED VIEW SHOWING POSITION OF SCOTCH TAPE PATCHES ON LARGE GEAR WHEEL



TOP VIEW

or one that chatters, skips a beat or has unwound itself? If you have, then try this simple motor control. It will not skip and it does not suffer from vibration. It is very positive in action and as long as the receiver is operating this motor control will do what it is supposed to do. The radio lads in the Winnipeg, Manitoba, area have cast aside other types of single channel escapement and are using only this. The unit can also be used in conjunction with multi-channel control.

"The motor used in the original unit is the Mighty Midget manufactured by Victory Industries (Surrey), Guildford, Surrey, England. The motor comes complete with a large gear wheel on one end and a small pulley on the other.

Construction and Assembly

"Cut a small strip of shim brass, about an eighth of an inch wide, to run from the Negative Terminal to the underside of the pulley sleeve. Install this strip then bolt the motor to a piece of eighth-inch ply wood, or sixteenth bakelite. This can be of a size to suit the individual, but it will be a part of the unit thus should be sized so that when mounted in the model it cannot move from back-jash from the rudder.

"Cut and mount two strips of shim brass to act as contacts bearing against the large gear wheel as shown in the diagrams. Stick on three small pieces of scotch tape in positions indicated in diagram. Note the position of these pieces of tape in relation to the centre line of the gear wheel. The pieces of tape act as circuit breakers. Other material, such as masking tape may be used, but scotch tape has been found to be the best.

"Solder a sixteenth inch diameter wire crank on to the face of the pulley. This should be soldered in position so that when the shim brass wiper No. 1 is resting against the scotch tape circuit breaker 'A' the rudder will be neutral. It doesn't matter whether the crank is to the bottom or top of the throw, but it will be necessary to remember which sequences or pulse rate to use. This is explained later.

Wiring

"It is important that only 1·5 v. be used as a power supply. This gives sufficient power to operate rudders on models up to about 54-in. span. If a larger model uses this type of control it might be necessary to use a balanced rudder. The shim brass wipers Nos. 1 and 2 are wired through the relay as shown. In other words, when you are not transmitting Wiper No. 1 is resting on circuit breaker 'A'.

"Note that the Negative supply runs from the Negative terminal through the shim brass wiper to the pulley sleeve then along the shaft to the large gear wheel and through one of the wipers, depending on which one is energised and also depending on the position of the relay.

"The crank on my particular motor is arranged to give 'Right' rudder first. Therefore, on receipt of a signal the relay completes the circuit through to No. 2 wiper and the motor rotates until Circuit Breaker 'B' breaks the contact. On release of the transmitter button the relay returns to idle thus completing the circuit through No. 1 Wiper and the motor rotates until Circuit Breaker 'A' breaks the contact. In this action the rudder, being on 'Right' now goes through Neutral over to 'Left' and back to neutral again.

"However, if you are holding "Right' rudder, then release the button and press it again the rudder will stop on 'Left'. The action is: when you have 'Right' rudder on then Circuit Breaker 'B' is holding the motor stationary; when you release the button the relay returns to idle and Wiper No. 1 is energised, thus the motor begins to rotate; however, as soon as you press the button again then the relay energises the circuit into No. 2 Wiper and Circuit Breaker 'C' comes around and breaks the circuit. Simple, isn't it.

"Therefore you have selective control in that you can have left or right rudder whenever you wish. Just remember that if one 'Press and hold' gives Right rudder, then 'Press-release-press-hold' will give left rudder. The unit may be adjusted to give left rudder first if so desired.

"As stated before, only 1·5 volts should be used. I find one pan cell sufficient. If 3 volts or more are used this will give the motor sufficient momentum to swing right past the Circuit Breakers and not stop as it should.

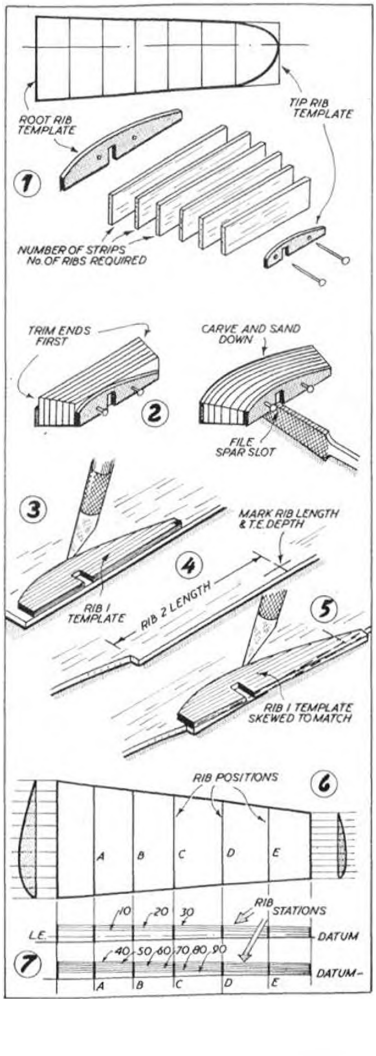
"It is imperative that all bearing surfaces should be clean and free from grease or oil. Thin piano wire may be used in place of the shim brass strips or wipers. Whatever you use make sure that the wipers do not press too tightly against the large gear wheel or the sleeve of the pulley. The wipers should be just 'springy' enough to make a firm contact.

"My unit, complete with one pan cell and a 2 in.x3 in. eighth-inch plywood base, weighs just 2¼ oz.

"Why not try one and judge for yourself."

Aeromodelling *Step-by-Step*

TAPERED WING-RIBS



THE SIMPLEST WAY of cutting a set of tapered wing ribs is by the "sandwich" technique (**1**). Templates of the root and tip ribs are cut from $\frac{1}{8}$ in. ply or similar hard material, the number of ribs required then being cut oversize as rectangles of balsa. The balsa strips are then stacked, preferably rubbed over a sheet of sandpaper to make sure that all the bottom edges are level, and the "sandwich" completed by fitting the two ply templates at each end, holding together with pins.

The ends of the "sandwich" are then trimmed to shape (**2**), when the balsa strips are simply carved and sanded down to shape the individual ribs. Rib slots should be cut or filed before separating the stack. For a set of ribs for the opposite wing, the "sandwich" is assembled the other way round.

This method has numerous limitations. It works best where the rib spacing is close and uniform and the taper is only moderate. If one of the templates is an actual rib position (i.e., the root rib in the example illustrated), this rib is cut separately. Similarly with the actual tip rib, if the tip template is plotted to this size instead of the equivalent "squared" tip position.

A better method where the taper is sharp and only a few ribs are required is to use only one template corresponding to the largest rib and cut the taper ribs individually. The first rib (rib 1) is cut directly from the template (**3**). On the balsa sheet then mark the exact length of rib 2 and the trailing edge depth required (**4**). The rib 1 template is then lined up over these markings —it will be "skew" to the edge of the sheet—and rib 2 cut. Rib 3 is cut in a similar manner by first marking out and "skewing" the template still more, and so on to complete the set of ribs required (**5**).

With this method the spar positions may have to be marked out separately. If the spar is *parallel* to the leading edge, the spar notch in the template can be used to mark the *position* of the spar notch on each rib, but the notch must be marked out and cut separately later. Cutting against the template would give an "angled" notch and one with insufficient depth (unless the spar is tapered).

The geometric method of marking out individual ribs for a taper wing is tedious, but is the most accurate and the only method really suited to plotting ribs for compound or curved tapered planforms. In this case the individual ribs are all drawn out and cut to these outlines.

Only the root and tip rib profiles need be calculated and plotted (**6**). The ordinates for each station for each of the other ribs are then established by drawing the wing in spanwise section, joining the 10 per cent. root rib station ordinate (height) to the 10 per cent. tip rib ordinate, and so on. Thus the corresponding 10, 20, 30, 40, etc., per cent. chord station ordinates can be measured direct for plotting the individual ribs, and will be accurate for both equal and unequal rib spacing. To avoid confusion, ordinate lines forward of the deepest part of the section are best plotted on one drawing, and ordinates aft of this on a second drawing (**7**). Instead of straight lines, of course, these ordinate lines can be curved, such as required to give true elliptic taper on an elliptic planform wing. Equally, of course, any change in section, such as a thinning of the aerofoil, or a change from a concave to a convex undersurface can be plotted accurately. In the case of undercambered ribs, further drawings should be used for plotting the undersurface ordinates as otherwise the original drawings will tend to get overcrowded and may be mis-read.

Club News

"Well, it's a new idea..." Tom Oliver of Seaham D.M.G. discusses his Bowden Contest R/C model with George Wylie. The model is powered with an Elfin 2.49.

WINTER RALLIES

27th January
Loughborough College—all classes.

3rd February
N.W. Area
Ternhill—
all f/f—combat.

TWO REPORTS this month make particularly interesting reading, touching as they do aspects that are of vital interest to the club movement. First of these comes from the Luton and D.M.A.S., giving details of their liaison with the local Grammar School by which the school club becomes affiliated to the "senior" club at a fee of one guinea a year. This all-in fee encourages the school club to go for the maximum number of members, and they have the privilege of entering all club contests, to attend meetings, and travel on club coaches at reduced rates. It is insisted that each member is insured. And what does the club get out of this philanthropic gesture? Encouragement of the school group brings dividends in the form of full members as the boys leave school, and continuity of interest is maintained.

Note of a reduction in the junior age limit for the Springpark M.A.C. appeared in our December, 1956, issue, and we are indebted for the following history of club activities that brought this about:

"Four years ago the writer and three flying companions decided to form a local club with the object of reuniting the scattered members of a previous club, disbanded some years before. Thus in March, 1952, the Springpark M.A.C. was founded with three committee members and one ordinary member . . . and there began the trials and tribulations of four earnest but misguided youths! Since we were all short of spare time as a result of our studies, our policy was 'minimum age 15 as we have no time to look after juniors'. A year later when the writer departed to two years' exile in the R.A.F. membership was just under a dozen, very few of whom were foolish enough to build a model aircraft, and even fewer got round to actually flying one.

"At this point more trouble came upon us: the Hon. Sec. was hauled into the Army and disappeared to Egypt and Cyprus, followed a year later by his successor (the third of the original three members) *en route* for the R.A.F. and Germany. This marked the lowest point of the club's career, and when the writer returned to home and sanity average attendance at club meetings was down to four to six members, and no flying meetings had been held for nearly a year.

"However, the long-awaited return of the Hon. Sec. coincided with the graduation of two of our best juniors to senior status, just about doubling our senior strength. As a result we took the plunge and lowered the age limit from 15 to 12 years . . . and that did it! In a few weeks the clubroom became a seething cross between a kindergarten and the Goon Show.

"During the next couple of months the club continued to grow; regular flying meetings were held; and a close watch was maintained on the standards of our new mob of juniors. From this, one clear fact emerged. Of the 12-year-olds very few showed any real interest, with one notable exception, but there were many between 13 and 16 who showed considerable promise. The floating population of 12-year-olds threatened the organising powers of a hard-pressed committee, and at the next A.G.M. the minimum age was raised to 13 years. Existing members were unaffected by this change, and we now have one keen member from this age group, the rest having drifted away. The current juniors are all improving rapidly and the seniors are having to look to their laurels. Membership is up to the thirty mark, and still increasing.

"Our experience then is that the only way to increase the numbers and standards of aeromodelling in a district is not only to allow juniors to join a club, but to ensure that the senior members take an active interest in helping and advising them so that they are not left with that "mine never fly" feeling that causes so many to drift away from the hobby. The justification of our policy came recently when we held an exhibition. Support was 100 per cent., and every model in the club was brought along and put on display—in fact the only problem was to keep enough juniors away from the work to enable the seniors to get on with it!

"May I add a last word to those clubs that have a membership problem: if you are willing to put some work into helping your juniors you will be amply repaid in active senior members in a few years time."

With all of which yours truly heartily concurs, and trusts that more and more clubs will give their attention to this vexed question of the junior enthusiast.

Northern

Latest trend in the **HUDDERSFIELD FLYING TIGERS M.A.C.** is towards slope soaring off Castle Hill, 980 feet above sea level. A number of the boys gave demonstrations during the past summer at various functions, finding in the process that a concrete Drill Hall yard is not conducive to combat flying!

London

WANSTEAD A.M.C. has been getting in plenty of combat contests recently, and the club Class A team race speed record has been pushed up to 92 m.p.h. by Dave Platt flying his "Revolver", using a standard 7 x 9 Stunt prop. C/L duration is creating a certain amount of interest.

November 17th saw the **SPRINGPARK M.A.C.** exhibition which proved highly successful. Centrepiece was an 8 ft. span R/C scale Comper Swift, and some 35 solids covering over thirty years of aviation. Great interest was shown in the Jetex-powered r.t.p. models, which made nearly 200 flights during the day. One adult was overheard to ask how they managed to get the planes to fly in such a constant circle! The "Their R/C" enthusiast tried to hold his audience with an activated solid model, but every time he pressed the button a model in the static display created a diversion by flapping its rudder!

The efforts of the **ST. ALBANS M.A.C.** contest men paid off well in 1956, recent successes being second place for Brian Cox in the Frog Senior, and Bruce Rowe's three max's and 5 : 13 fly-off in the Flight Cup in almost perfect conditions. He flew his Queen's Cup Wakefield winner plus an extra ounce of rubber to give it the old type of climb. A very lucky progression to the final of the L.T.H.C.C. Cup brought them up against Hayes, when their run of good fortune failed to continue and the Hayes lads beat them by some seven minutes. Active junior Paul Finn is leading both the junior and senior sections in the club points contest. This state of affairs, where the juniors give the seniors a good run for their money, is likely to end up with the juniors giving instruction to the seniors—a very simple solution to the junior question!

Scotland

In the recent Ayrshire Gala, the **PRESTWICK M.A.C.** had two models in the "A" to finals. Bad luck dogged both, for the "Tiger Terrier" elevator linkage gave up the ghost, whilst the Muir-tuned Frog 100 took mysteriously lost its compression screw when in the lead. The Area and Ayrshire stunt events went to J. Muir for the second year running.

East Midland

IPSWICH M.A.C. now has the use of Raydon Aerodrome whilst the farm land is lying fallow, and the old bomb disposal points provide perfect team-race circuits, a luxury previously unheard of. Junior member R. Vince piled up his Calypso minutes after establishing a new club power duration record with a ratio of 28:1. The first major use to which club funds have been put is the purchase of a new stop watch.

Outdoor flying in the **NORWICH M.A.C.** is now confined to the local parks, the airfield previously used being "not available" due to the Suez crisis. This has been partly offset by the acquisition of one of those supreme rarities—an aeromodelling female! This probably accounts for the fact that twenty males have recently joined the club!

Southern

Pleased to report that the **WINCHESTER M.A.S.** has taken on a new lease of life, and the few stalwarts who persisted in flying models have been rewarded for their efforts, the club now numbering some 25 members.

Biggest drawback at present is lack o a clubroom, but it is hoped to overcome this shortly. C. Black took three of the six club trophies at a recent presentation, and strangely enough the Treasurer and Chairman took the glider and rubber classes. Wonder what the Comp. Sec. was up to?

North Western

The old walled town of Chester was the venue of the Area A.G.M. on November 24th. Votes of thanks were passed to the committee for the excellent organisation of Area activities; Chairman Mr. Nixon was returned unopposed, and Ray Musgrove was returned again as Secretary. It was decided to split the responsibilities of P.R.O. between Area and National requirements. Mixed feelings greeted the news of the World Championships split-up . . . petrol rationing is no excuse to drop power!! Some all-rounders feel it will relieve the pressure a bit, and John O'Donnell was overheard discussing speed models—presumably getting a few tips for the 1956 Trials. A dinner followed the serious business of the day, when the Area trophies were presented by Mrs. Nixon, Johnny O'D. collecting the lot with the exception of the power trophy, which went to D. W. Jackson of Ashton. Ex-chairman Pete Foulkes was presented with a two-day clock, not as a means of timing records, but to celebrate his recent marriage. The evening finished up with fun and games, ably abetted by heavyweight Don Salloway who bulldozed his side to victory in more than one contest!

1957 S.M.A.E. COMPETITION PROGRAMME

(continued from last month)

9th June
BRITISH NATIONALS:
THURSTON CUP: Unrestricted Glider
SHORT CUP: 2·5 c.c. Class
PAA Load — Centralised
GOLD TROPHY: C/L Stunt
S.M.A.E. TROPHY: Radio Con.
INTERNATIONAL TAILLESS: Eliminators — Waterbeach
DAVIES TROPHY: Team Race A
SPEED: All Classes

10th June
BRITISH NATIONALS:
SIR JOHN SHELLEY CUP: Unrestricted Power
MODEL AIRCRAFT TROPHY: Unrestricted Rubber
SUPER SCALE TROPHY: Power Scale — Centralised
AEROMODELLER TROPHY: Radio Control — Waterbeach
DAVIES TROPHY: Team Race B
SPEED: All Classes (2·5 c.c. Eliminators)
INTERNATIONAL TAILLESS:

23rd June
RADIO CONTROL RALLY
Woburn Park

29th and 30th June
INTERNATIONAL TRIALS Centralised

7th July
PILCHER CUP: Unrestricted Glider
WOMEN'S CUP: Unrestricted Glider/Rubber — Decentralised

14th July
SCOTTISH GALA:
CATON TROPHY: Unrestricted Rubber/Glider/Power
TAPLIN TROPHY: Radio Con.
TEAM RACING A and B
SPEED: All Classes — Centralised

4th/6th August
S. MIDLAND AREA RALLY—Cranfield

Several **SHARSTON D.M.S.** members attended Tern Hill for the C.M.A. Cup, junior M. Macconnall doing best with a creditable score of 8 : 20 flying a lightweight "Nebula". R. Gammons (now lost to the R.A.F.) set up a new club autogiro record of 2 : 13 with an o.d. Dart-powered model. Indoor teamracing and e.t.p. microfilm models have been showing their paces on recent club evenings.

NOTE.—The N.W. Area Committee announce a Winter Rally to be held at Tern Hill Aerodrome on February 3rd. Unrestricted rubber, power and glider classes will be held (three flights, 3-min. maxs.) and C/L Combat to S.M.A.E. 1957 rules. Three prizes in each class. Pre-entry is required to: J. Chadwick, 129 Mottram Road, Stalybridge, Cheshire.

Midland

LOUGHBOROUGH COLLEGE M.A.C. are staging a friendly Rally on January 27th for all types of models. All are invited for a good day's flying at their 'drome. Please notify new club sec.: D. R. Topham, Loughborough College, Leicester.

LEICESTER M.A.C. is still very much alive (who said it was dead?), and membership is now over 60. Their annual dinner was held recently and proved once again that the members can still eat, even if they do not sleep much. A number of pots were presented, and J. Andrews declared club champion on maximum points gained in all comps. Their winter building contest, which is now a handy annual, is under way, this year being for power duration types. Winter meetings are held alternate Wednesdays in Catherine Street Schools.

CHESTERFIELD SKYLINERS M.A.C. were successful at long last in Class A team race when Mr. Vaughan and his son took first place at Hyde. This was mainly a feat of endurance, theirs being the only model to finish the final! More and more T/R activity takes place as the club acquire more Oliver Tigers, and R/C is becoming very popular.

South Eastern

The recent Area A.G.M. showed that, for the first time since that disastrous year of 1950, the Area is solvent.

SOUTHERN CROSS report with "heavy hearts" the demise of "Halcyon", Graham Gate's 14-ft. span glider. Death occurred after a remarkably short and severe illness and was followed by cremation on the spot. Whilst mourners recoiled from the heat, the Last Post and Reveille were reverently sounded on comb and paper. This untimely passing has brought to nought plans which were in hand to have the model classified as an ancient monument.

Western

BRISTOL ACES are going from strength to strength, membership being 42 at the moment. A new clubroom has been obtained, which should swell the numbers even further. R.T.P. flying takes place alternate Wednesday.

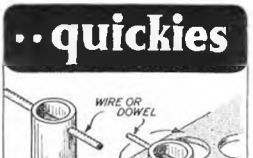
Pen Pals are required for the following: Zdzislaw Hennies, Lublin, ul. Narutowicza 41, Poland; and L. H. Gimblett, Lalapanzi, Harton St. Davids, Somerton, Somerset.

THE CLUBMAN.

SECRETARIAL AND ADDRESS CHANGES

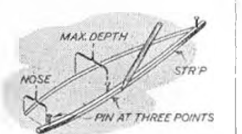
BRISTOL ACES M.A.C.
P. Dinnage, 36 Toronto Road, Horfield, Bristol 7.
HALIFAX M.A.C.
K. Attiwell, 118 Cousin Lane, Illingworth, Halifax, Yorks.
CRITTALL (BRAINTREE) M.A.C.
V. W. Balury, 7 Pagiot Yard, Hocking, Braintree, Essex.
CHORLTON M.F.C.
R.D. Barker, 98 Dudley Road, Whalley Range, Manchester 16.

··quickies



Circle cutters made from steel, brass or dural tube.

Fuse wire binding strengthens soldered joints, e.g. washer on propeller shaft, etc.



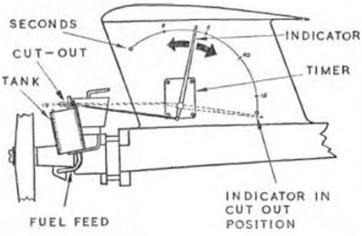
Drawing fuselage side elevation let strip wood conform to natural curve.


One piece winder loop and freewheel clutch eliminates soldering.

Large silk streamer tied to glider winch prevents loss in long grass.

Good tow hook shapes prevent line slipping off prematurely on tow.

Odd tips . . .

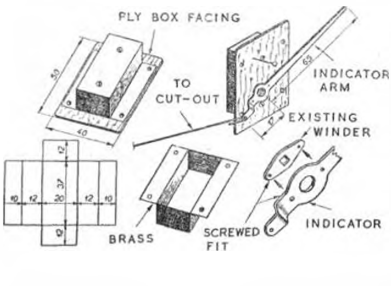


CZECHOSLOVAKIAN TIMER/TANK SYSTEM

A feature of the Czech models seen last year at Cranfield was the universal use of a most efficient timer/tank cut out scheme. As seen above, a standard camera timer of the Autoknips type, is arranged to pull a trip wire on a standard plunger cut-out, such as are available in British model shops. This cut-out is built into a metal tank, which is in mounted on the engine itself, close to the needle valve. By virtue of the tank position, there is no variation in fuel feed (gravity) throughout the power run.

Adaptation of the timer is seen below. Dimensions for a new timer body in thin brass are given in millimetres and this is arranged to screw to the back of a ply mounting plate. Timer also has an extended indicator arm attached to the normal winder for finely graduated readings. As can be seen in the view of the complete timer, a common pin is used as a stop while starting up, and setting the engine for flight.

A further point concerning this very efficient arrangement is that the fuel and tank weight are brought forward, enabling a short nose moment arm to be used—always an advantage with a contest power model.



Modellers can be assured of personal service coupled with expert knowledge of aeromodelling requirements at any of the following shops.

We invite bona-fide aeromodelling traders to take advantage of this feature, in which space is available at moderate cost.

AUSTRALIA *Tel.: Melbourne Cent. 918*

CENTRAL AIRCRAFT CO., PTY.

5 PRINCES WALK
MELBOURNE, C.1

Australia's Main Distributor for: "Aeromodell.r", "Model Maker" and their Plans Service.

BIRMINGHAM *Tel.: MIDland 0972*

HORNTON'S
(Models and Toys) Ltd.
32 STEPHENSON STREET, BIRMINGHAM, 2.
(Facing Stage Door of Theatre Royal)
& 1 NAVIGATION ST., BIRMINGHAM, 2.
(adjoining Queens Hotel)
Stockists of Model Aircraft, Railways and Ships.

BLACKBURN

RAWCLIFFE'S
FOR MODELS
38 WHALLEY RANGE,
BLACKBURN
MODEL BOAT KITS
AIRCRAFT KITS
ENGINES & ACCESSORIES

BOLTON *Tel.: 7097*

ROLAND SCOTT

The Model Specialist
147 DERBY STREET
The obvious shop for all Model Aircraft Requirements.

CANTERBURY

MEERS (Engineering) LTD.
THE MODEL SHOP,
20 SUN STREET,
CANTERBURY
(Under the Shadow of the Cathedral)
The largest stock of Aeromodelling Equipment in East Kent. Your visit welcomed. By-return Postal Service.

DONCASTER *Tel.: 2524*

B. CUTTRISS & SONS
MODELS AND HANDICRAFTS
49-51 CLEVELAND STREET
Call and see our Shop

GLASGOW

CALEDONIA MODEL CO.
Model and Precision Engineers
5 PITT STREET, C.2
Our works at your service for engine repairs, rebores and rebuilds. Everything for beginner and enthusiast.

GUILDFORD *Tel.: Guildford 2274*

PASCALLS MODEL SHOP
105 WOODBRIDGE ROAD,
GUILDFORD
The shop devoted entirely to scale models of all kinds. Kits—Materials—Accessories.

HONG KONG *Tel.: 57662*

RADAR COMPANY
2 OBSERVATORY ROAD
TSIN SHA TSUI, KOWLOON
The most complete stock of aeromodelling equipment in the Far East. Run by experienced modeller. Agent for Solarbo, Britfix, and O.S. Radio Equipments.

LONDON *Tel.: BAT 6319*

E. F. RUSS
97-101 BATTERSEA RISE,
S.W.11
A COMPLETE STOCK FOR MODELLERS. GIVE US A VISIT OR ORDER BY POST

LONDON *Tel.: Hop 3482*

MODEL AIRCRAFT SUPPLIES LTD.
171 NEW KENT ROAD, S.E.1
The oldest established aircraft shop in London.
Service with satisfaction from **Harry York**

MANCHESTER *Tel.: BLA 3972*

THE MODEL SHOP
13 BOOTLE STREET,
OFF DEANSGATE,
MANCHESTER 2
The Model Aircraft Specialists. Mail orders by return. Post Free over £1.

MANCHESTER *Tel.: BLA 6159*

MODEL SUPPLY STORES
17 BRAZENNOSE STREET, MANCHESTER 2
Manchester's Main "Mecca" for every make of KIT, ENGINE & ACCESSORIES, Solarbo, BALSA, etc.
Northern SKYLEADA Factory.

ST. HELENS *Tel.: 3972. Ext. 1*

GEORGE WEBSTER (St. Helens) LTD.
CORPORATION STREET,
ST. HELENS
ALL LEADING AIRCRAFT KITS AND ACCESSORIES, XACTO TOOLS, PLASTIC CAR AND PLANE KITS, BOAT KITS.

WATFORD

CRAMER'S
The Hobby Haven of West Herts.
172a High Street, Watford
Near Watford High Street Station (Bakerloo), full stocks of all that's new—special aeromodelling section on first floor. Fishing, Trains, Boats, Games

READERS' BINDING

Readers who require their copies permanently bound in red cloth with gold block title on spine should send their 12 copies securely packed to the editorial office together with remittance for 12s. 6d. A limited number of BOUND VOLUMES for the year 1956 are available at 32s. 6d. post free.

THE "AEROMODELLER"
38 CLARENDON ROAD, WATFORD, HERTS.

CLASSIFIED ADVERTISEMENTS

FREDS DATE for issue, March 1957, January 21, 1957

ADVERTISEMENT RATES:

Private — **Minimum 18 words 4s., and 4d. per word for each subsequent word.**

Trade — **Minimum 18 words 12s., and 8d. per word for each subsequent word.**

Box numbers are permissible, to count as 6 words when costing the advertisement.

COPY and Box No. replies should be sent to the Classified Advertisement Department, The "Aeromodeller," 38 Clarendon Road Watford, Herts.

FOR SALE

American K & B Sky Fury twin-cylinder 2·5 c.c., £6; Attwood Cadet 0·9 c.c., 50s. Both brand new. O.K. Club 1·2 c.c., nearly new, 35s. P/O C. Taylor, Officers' Mess, R.A.F. Colerne, Wilts.

Brand new, in original box, Barbini B.38 1 c.c. diesel, redhead, Italian rotary valve, 42s. Box 506.

Brand new "All About Aircraft" Desoutter, cost 25s., accept 12s. 6d. 112 Aldenham Road, Bushey, Herts.

Frog 150 Petrol new, complete with coil, condenser, timer, switches and two plugs, £5, or offer. J. May, Creag-Eindh, Knoydart, Mallaig, Inverness-shire.

E.D. Bee Mark II, perfect condition. Offer nearest 35s. Evans, 2 Bower Street, Kenfig Hill, Bridgend, Glamorgan.

Frog 150D, E.D. Baby, 35s. each. Frog 150D 37s. 6d. All excellent. Genuine enquiries, S.A.E. Roberts, 14 Aldersley Avenue, Tettenhall, Staffs.

E.D. Boomerang hard valve radio unit complete. Book. In perfect order, £7 10s. Also Mills 1·3, very good condition, 45s. Mills ·75 good order, 25s. D. Norman, 33 The Mount, Leatherhead, Surrey.

E.D. Boomerang Tx and Rx, excellent condition with Mk. III and Typhoon components, £8. 67 Elmington Road, Exeter.

Webra 1·5, Mach 1, Frog 150 2·49, Oliver Tiger Mk. III, K & B 15, Elfin 1·8, A.M. 3·5, Hill Aircat and Fox 29. Offers to Jubb, 13 Manor Avenue, Liverpool 23.

Solid modellers bargain packs! Send stout S.A.E. and 1s. P.O. for bumper 1939-45 war-time transfer set, British, German, Japanese, with solid model wheels, or 2s. 6d. for same plus balsa knife, dummy radial engine, propellers, extra wheels. Worth treble ! ! C. Herring, 152 Tomswood Hill, Barkingside, Essex.

WANTED

Pulse Jet, please state size, price, thrust. P. Doherty, c/o Robertson, 3 Wardour Street, Glasgow, Scotland.

Mills ·75, 1·3 E.D. Bee Racer. Allbon Dart. Must be good and cheap. Box 505.

Wanted, "Jane's Aircraft" and bound volumes of "Flight", any. Harold Storey, 3 Cecil Court, London, W.C.2 (Temple Bar 3777.)

Complete contact breaker for super Cyclone in good condition. Also let assembly, needle and tank. State Price. D. Blackwell, 57 Melbourne Road, Coventry.

BOOKS

American *Magazines*. Year's subscription *Model Airplane News* 35s. Full Catalogue free. Willen Ltd. (Dept. I), 9 Drapers Gardens, London. E.C.2.

peak performance

E.D. TRADE MARK

TUNED REED
6 CHANNELS

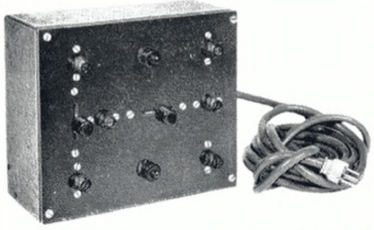
Mk V. "EVEREST"

MULTIPLE RADIO CONTROL UNIT

The crowning achievement for the remote control of all Models.
The PROTOTYPE of this Set "swept the board" at
the Radio Control Competitions during the Season 1955.

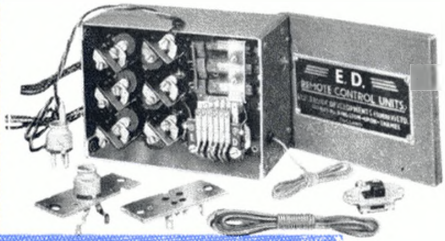
CONTROL BOX

Control Box size, 6" x 5¼" x 3¼", giving up to 6 Controls with ample lead to Transmitter easily held by hand.



RECEIVER

Fitted with Standard Hard Valves with an average life of 3,000 hours, and 6 Standard Relays. The Receiver output will operate either Electric Motors or Escapements.



ALL BRITISH Rally

multi radio-control contest

held at Radlett (Herts), September 16th, 1956

THE FIRST FOUR ALL USED E.D. RADIO EQUIPMENT

1st O. E. Hemsley
E.D. "EVEREST" Radio Unit

2nd V. Breeze
E.D. "EVEREST" Radio Unit

3rd D. H. Caphard
E.D. Mk. IV Radio Unit

4th R. Higham
E.D. "EVEREST" Radio Unit

TRANSMITTER

Self-contained for housing all batteries, and with 8 foot sectional Aerial. Fitted with 2 Standard Hard Valves (1 Mullard D.L.92, 1 Mullard DCC 90).
PRICE complete (including Purchase Tax)

£ 29. 3. 11

RECEIVER ONLY (including Purchase Tax) £17/15/3
CONTROL BOX ONLY (inc. Purchase Tax) £4/12/5
TRANSMITTER ONLY (inc. Purchase Tax) £6/16/4

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD
DEVELOPMENT ENGINEERS
ISLAND FARM RD. WEST MOLESEY, (SURREY) ENGLAND.

Write for our NEW Illustrated Folder giving full details of all E.D. ENGINES, RADIO CONTROLS, SPARE PARTS, ACCESSORIES, etc. **Order from your model shop.**

Made and printed in Great Britain by the Croydon Times Ltd., 104 High Street, Croydon, for the Proprietors, The Model Aeronautical Press Ltd. 38 Clarendon Road, Watford, Herts. Published by the Argus Press Ltd., 42-44 Hopton Street, London, S.E.1, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

FOR QUALITY

IT'S

KEILKRAFT

. . . and the prices are reasonable

The Stunt Model for ·5 c.c. diesels !

The JOKER

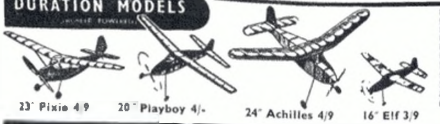
½-A CONTROL LINE STUNT MODEL

19½-inch WINGSPAN

For ·5 c.c. Stunt Flying there's nothing to touch the JOKER. Both for value and performance, this is one of K.K.'s outstanding kits. Contents include ready-to-use metal fuel tank, pre-formed undercarriage, all ply and balsa parts die-cut, cement, tissue, strip balsa, etc., plan and instructions. Compare with any other .5 stunt model kit, and then compare the prices. **11/5**

And here are just a few of the many inexpensive, under 5 - kits in the K.K. range

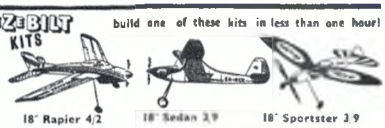
DURATION MODELS



23" Pixie 4/9 — 20" Playboy 4/- — 24" Achilles 4/9 — 16" Elf 3/9

EEZEBILT KITS

build one of these kits in less than one hour!



18" Rapier 4/2 — 18" Sedan 3/9 — 18" Sportster 3/9

GLIDERS

30" Dolphin 4/9 — 20" Cub 3/- — 30" Cadet 4/9 — 20" Nomad 4/2

PREFABRICATED CHUCK GLIDERS

12½" Spook 1/9½ — 12" Vega 1/6 — 20" Polaris 3/- — 14" Comet 4/2

SOUTHERNER MITE

A graceful streamlined cabin model, featuring polyhedral, elliptical wing for efficient flight characteristics. Takes diesels from .5 to .75 c.c. 32-inch span. **12/9**

PIRATE

Just the design for the small diesel owner, and suitable for motors from ·5 c.c. to 1 c.c. Performance is in the contest class, and building is simple. 34-inch wingspan. **14/3**

See the KK JUNIOR FLYING SCALE SERIES at your dealers. A wonderful selection of authentic planes at 3/9 each

The Toughest Prop Ever Made!

KEILKRAFT "TRUFLEX"

The tough flexible plastic prop that will outlast a dozen wood props. Also prevents damage to motor crankshaft. In sizes to fit all motors

6 in. dia. x 4 in. pitch	3/-	9 in. dia. x 4½ in. pitch	4/9½
7 in. dia. x 8 in. pitch	4/2½	9 in. dia. x 8 in. pitch	5/1½
8 in. dia. x 4 in. pitch	4/2½	10 in. dia. x 8 in. pitch	6/-
8 in. dia. x 6 in. pitch	4/6	11 in. dia. x 5½ in. pitch	6/-
8 in. dia. x 8 in. pitch	4/6	14 in. dia. x 6 in. pitch	12/9

Now Available at your nearest Model Shop

1957 KEILKRAFT HANDBOOK & CATALOGUE PRICE 1/3

[illegible] KEIL & CO. LTD. 1/6 post free

BUY KEILKRAFT AT YOUR LOCAL MODEL SHOP

If no model shop convenient, order direct from KEILKRAFT. Please add 6d. extra packing and postage.

Sole distributors in U.K. for

ALLBON & D.C. Engines
ELMIC Timers and D/Ts.
ELFIN Engines
AEROKITS boat kits

Also distributors for E.D., E.C.C., BRITFIX AMCO, and the famous **LINDBERG** Plastics

KEILKRAFT — THE GREATEST NAME IN MODEL KITS

Manufactured by E. KEIL & CO. LTD., WICKFORD, Essex *Phone: Wickford 2316*